# OCEAN & INLAND WATER TRANSPORTATION

EMORY R. JOHNSON

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# OCEAN AND INLAND WATER TRANSPORTATION

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TO

MY WIFE

IN APPRECIATION OF HER

HELPFUL CRITICISM

# PREFACE

The discussion of transportation by water naturally divides itself into two parts, transportation upon the ocean and upon inland waterways. Ocean transportation exceeds the traffic of inland waterways in volume and importance, and, for economic and political reasons, merits more detailed consideration. Accordingly, about four-fifths of this volume is taken up with Book I, devoted to ocean transportation. Inland waterways and their traffic are dealt with in Book II. The volume, as a whole, is a treatise on the economics of transportation by water and is intended to be a complement to the author's work on "American Railway Transportation," the first edition of which appeared in 1903.

The author is under special obligations to his colleague, Dr. J. Russell Smith, of the University of Pennsylvania, whose valuable monograph on "The Organization of Ocean Commerce" and whose unpublished notes have been of assistance in writing several chapters. The author is also indebted to Mr. Frank L. Neall, of the firm of Peter Wright and Sons, Philadelphia, for preparing the tables of port charges and furnishing the freight shipping papers that are reproduced. Much of the information contained

in the volume has been secured by correspondence with government officials and business men, but aid has been given by so many persons that the author must content himself with a general acknowledgment of the value of their coöperation.

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E. R. J.

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# *BOOK ONE*

# *OCEAN TRANSPORTATION*

## INTRODUCTION

# INTRODUCTION

Ocean transportation may be treated either as a technical subject or as a division of economics. Considered in its technical aspects, the study is concerned either with marine engineering or with the art of navigation. The economics of the subject has to do with the service of ocean transportation. The study includes the relations of ocean carriers with each other, with the traveling and shipping public, and with the Government whose duty it is to aid and regulate the business of ocean carriage.

Much more has been written on the technics than on the economics of ocean transportation; indeed, most non-technical treatises on ocean transportation have been either historical or statistical in character. Book One of this volume is an economic treatise dealing with the ocean transportation service. It contains but a brief account of the history of shipping, and presents only such statistics regarding traffic as are required to indicate the nature and scope of the service.

The history and description of the ocean transportation system having been briefly presented in Part I, the freight, passenger, mail, and international express services of ocean carriers are considered in Part II. The third division of Book One is concerned with the relations of ocean carriers with each other and with the public, with the organization of ocean transportation, competition and monopoly, agreements of ocean carriers with each other and with railroads, ocean rates and fares, and

marine insurance. The last division of Book One discusses Government aid and regulation, analyzes the causes accounting for the decline of the American merchant marine, and considers the various legislative methods of promoting the shipbuilding and maritime interests of the United States.

Ocean transportation has been less thoroughly and systematically studied in the United States than has railway transportation. Well-known facts of American history readily account for this. For nearly a century the energies of the American people have been devoted mainly to the occupation of their wide territory, and to opening up for present and future development the vast natural resources of their country. The phenomenal rapidity with which this work of subjugating a continent and of taking possession of its natural wealth has proceeded has been made possible by the railroad. In no other country has the railway net been spread so rapidly, and nowhere else has the economic progress been so great.

It is, accordingly, not surprising that lawmaker, historian, and economist, as well as capitalist, have, until recently, interested themselves more in railway transportation than in inland navigation or ocean transportation; that American transportation legislation and literature, both past and current, give far more attention to the technical, economic, and political aspects of the railroad service than to the development and management of the business of ocean carriage. It is a noticeable fact, however, that there is an increasing public appreciation of the importance of the development of the shipbuilding and maritime interests of the United States. Having supplied our country with an adequate and highly efficient railroad system, and having arrived—as we now apparently have—at a clear understanding of the problem of equitably adjusting the relations of railroad carriers to

the public, our attention is naturally turning to a study of the economics of ocean transportation, and to the legislative problems connected with securing an American merchant marine that will correspond in size and rate of growth with our large and steadily increasing foreign commerce.

The transportation problem of the past half century in the United States has consisted mainly of securing the construction of railroads and solving the question of their proper and adequate regulation by the Government. The chief American transportation problem of the ensuing twenty-five or fifty years promises to be the development of a merchant marine commensurate with our commercial needs, and the discovery and application by our Government of the maritime policy that will best promote our economic and political progress. Our economic interests have overrun our home boundaries; our political obligations and ideals have become international with surprising swiftness; and whether we will or not, we shall perforce be obliged to shape our industrial progress and our political institutions more and more in accordance with international requirements.

Without doubt, we shall sooner or later become a great maritime nation; not only because we shall have a large foreign commerce to be transported, and, indeed, not primarily because our political interests will necessitate our having a strong navy, but more and chiefly because the accumulation of capital at home, and the widespread investment of American capital in foreign countries, will steadily create more favorable conditions for American shipping and shipbuilding, and will give the American people increasingly stronger reasons for engaging in ocean transportation. Our economic and political evolution, it seems certain, will eventually make us a maritime nation.

The "merchant marine question," as a political problem, is one of deciding whether, and how, legislation can shorten our road to maritime success, and of deciding whether the results that may be accomplished by Government aid to ocean transportation will justify the expense which public assistance will involve. Both political and economic factors must be considered in solving the American merchant marine question; the economics of the service must be understood, and the possibilities and limitations of legislative measures in aid of the service must be known.

The discussion of the economics of ocean transportation in this volume, while not written primarily or mainly for the purpose of illuminating the political aspects of the merchant marine question, ought, by dealing systematically with the ocean transportation service, to aid in reaching an intelligent decision regarding maritime legislation. Indeed, the relations of the national, State, and local Governments to ocean transportation are so intimate and vital that this treatise on the economics of ocean transportation devotes several chapters at the end of Book One to the relation of the Government to the development of the merchant marine.

# PART I

# THE OCEAN TRANSPORTATION SYSTEM

# CHAPTER I

## THE MEASUREMENT OF VESSELS AND TRAFFIC

IN describing the various types of vessels, and in discussing ocean transportation, frequent use must be made of the words "ton" and "tonnage," and, in order to avoid confusion and error, it is necessary to keep clearly in mind the several meanings in which these terms are employed. Tonnage may refer either to the size of the vessel or to the amount of the ship's cargo; accordingly, there are two distinct kinds of tons: the vessel ton and the cargo ton. Each of these two kinds of tons is used with several different meanings.

Vessel tonnage is of three kinds: displacement, gross register, and net register. The displacement tonnage of a vessel is its weight, and is equal to the weight of water displaced by the ship when floating. The gross register tonnage is obtained by dividing the number of cubic feet in the capacity of the ship by 100. A vessel has one "gross" ton for each 100 cubic feet of capacity.[1] The net register tonnage is obtained by dividing by 100 the capacity in cubic feet of the space available for cargo

[1] This method of determining gross-register tonnage dates from 1854. To secure a uniform practice in measuring and registering vessels the British Government, in 1852, adopted a method of measuring the cubical capacity of hulls that a Mr. Moorsom had worked out. The Admiralty, not wishing to change the statistics of the tonnage of the British marine more than was necessary, instructed Mr. Moorsom to submit a plan of applying his method in such a way as to cause a minimum change in the existing registry of ships. Mr. Moorsom found that the total registered tonnage of the British merchant marine as then registered was 3,700,000, and he found that by the application of his system of

and passengers. From the entire capacity of the ship are deducted the spaces occupied by machinery, crew accommodations, and certain other housings, carefully designated by law; and then the number of cubic feet in the remaining capacity is divided by 100 to obtain the net register.

In the shipping statistics of all countries a ton gross register means 100 cubic feet of ship capacity; but as the rules applied in measuring the capacity are not identical in all countries, vessels of the same size under different flags may vary slightly as to gross tonnage. In the determination of the figures for net registry the laws of different countries vary more than they do in regard to gross registry; nevertheless, with the exception of the "Danube" measurement, which is applied to all vessels passing the Suez Canal, the British practice as regards the measurement of gross and net tonnage is followed with minor variations by all commercial countries.

The rules of the Danube measurement were adopted at Constantinople in 1873 for the Suez Canal by the International Tonnage Commission. The net register tonnage of vessels when measured by the Danube rules will average fully one-fifth more than when measured in accordance with British or American laws.[1] The canal tolls are levied on net tonnage.

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measurement the total capacity of the hulls of the British fleet was 363,412,456 cubic feet. "If," said he, "the real total capacity in cubic feet is divided by the total registered tonnage the dividend will be the figure by which the capacity in cubic feet must be divided in order to produce this registered tonnage." The ratio of existing tonnage (3,700,000) to Moorsom's figures for capacity (363,412,456) was 98.22, but for the purpose of easy calculation the British Government adopted a divisor of 100 instead of 98.22, and this figure was incorporated in the Merchant Shipping Act of 1854.

[1] The laws of the United States regarding the measurement of vessels may be found in Sections 13 to 26 of the Navigation Laws, Bureau of Navigation, Department of Commerce and Labor, Washington, D. C.

The cargo ton is of two classes, weight and measurement. The weight ton may be the "short" ton of 2,000 pounds, the "long" ton of 2,240 pounds, or the metric ton of 2,204.62 pounds. The traffic of American railroads and waterways (with the exception of anthracite coal, which is handled by the long ton in the Eastern States) is measured by the short ton, and this ton is the one generally used within the United States. In ocean commerce the weight ton is the long ton of 2,240 pounds, except in the trade of those countries that use the metric system and employ the metric ton of 2,204.62 pounds.

A large share of the cargo of ocean traffic is not shipped by weight, but by the measurement ton of 40 cubic feet. Grain and minerals move by weight; but manufactures, general merchandise, and even lumber, are regularly handled by the measurement ton. The adoption of 40 cubic feet for a measurement ton is said to be due to the fact that a long ton of wheat occupies 40 cubic feet in the hold or berth of the ship. In the Government statistics of the cargo tonnage of ocean commerce, both the long ton and the measurement ton are included, and it is not possible to ascertain the actual weight of the traffic of ocean commerce.

The ratio of net register to gross register tonnage and cargo tonnage of a modern freight vessel loaded with general cargo is as 1 to $1\frac{1}{2}$ and to $2\frac{1}{4}$. The net register is about two thirds the gross, and the cargo tonnage averages about $2\frac{1}{4}$ times the net register. In the large modern sailing vessel the net register is about seven eighths of the gross, and the cargo tonnage of the loaded vessel will average about $1\frac{2}{3}$ times the net register.

All vessels flying the American flag are listed and documented by the United States Government. Before a vessel can be put into service its machinery must be inspected, and the ship measured, by officials connected

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with the Bureau of Navigation in the Department of Commerce and Labor. The vessels engaged in foreign commerce are "registered," and those employed in our inland and coastwise commerce are "enrolled." All vessels of less than 20 tons measurement are "licensed." It is customary to use the term "registered" tonnage when speaking of our shipping engaged in foreign trade, and of "enrolled" tonnage when referring to our domestic vessels.

## CHAPTER II

### THE HISTORY OF THE OCEAN CARRIER—THE SAILING VESSEL

The brief sketch of the technical history of ocean transportation presented in this and the following chapter is written with reference to the transportation of the maritime commerce of the British colonies in America and of the United States. The account is confined to the period since the beginning of the seventeenth century, and contains a description of the several types of ocean carriers that have been successively employed by Americans for the carriage of their domestic and foreign commerce.

The two general types of vessels now used in ocean commerce, the sailing vessel and the steamer, have passed through numerous stages in reaching their present highly efficient forms, and a brief study of the evolution of the sailing vessel during the past three hundred years, and of the steamship during the past century, will throw light upon the history of the service as well as of the agent of ocean transportation. In general, the agencies employed are developed with reference to the service; and they indicate, at least in a rough way, the nature and importance of the transportation services performed from period to period.

The ship is a tool or mechanism used mainly by shippers to accomplish commercial exchanges. The adaptation of the mechanism to the work to be performed has

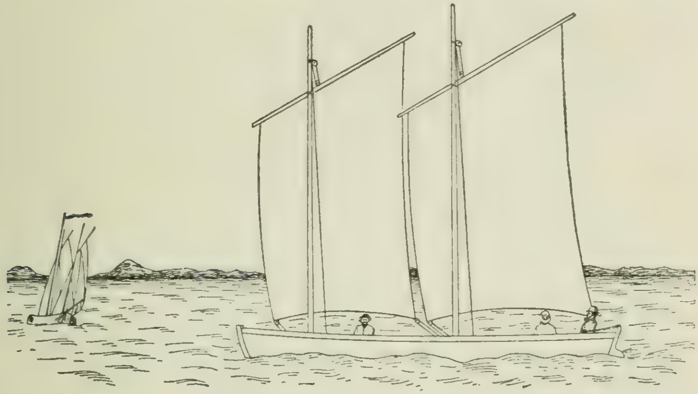
been far more rapid during the past fifty years than during previous periods; but at all times shipwrights must have striven to build as efficient ships as the technical knowledge and material resources at the command of the builders would permit them to construct. It is a fact sometimes overlooked, that the present-day organization and management of domestic and foreign trade necessitate the use of types of vessels very unlike those required by traders a hundred years ago. While it is true that the technical improvements in transportation and communication facilities have made possible the existing organization of commerce, it is equally true that the size and character of ships now being built are determined by the requirements of trade. This fact will be illustrated in later chapters.

Until the fifth decade of the nineteenth century the sailing vessel was the only ship employed in ocean commerce. In its technical evolution numerous types have been successively constructed, to each of which special terms were applied that need to be explained in order to be understood by the landsman who has not made a study of nautical phraseology. The various kinds of sailing vessels are classified mainly according to the number of masts the vessel has, and the rig of its sails. The shape of the bow and hull (as in the case of the "clipper ship") may also account for the name given to the type of ship.

There are two methods of rigging the sails on the masts. In the "square-rigged" vessel, the yards or beams to which the sails are attached are so suspended from the mast as to cross the mast and extend equal distances on each side; while in the "fore-and-aft" rig the yardarms by which the sails are spread do not cross the mast, but extend from only one side of the mast.

A full-rigged "ship" is a sailing vessel having three

or more masts, on all of which the sails are square-rigged. A three-masted vessel having its two forward masts—the fore and main masts—square-rigged, and its after- or mizzenmast fore-and-aft rigged, is a bark. A barkentine has the foremast square-rigged and the main- and mizzen-masts rigged fore-and-aft. A brig is a vessel with two



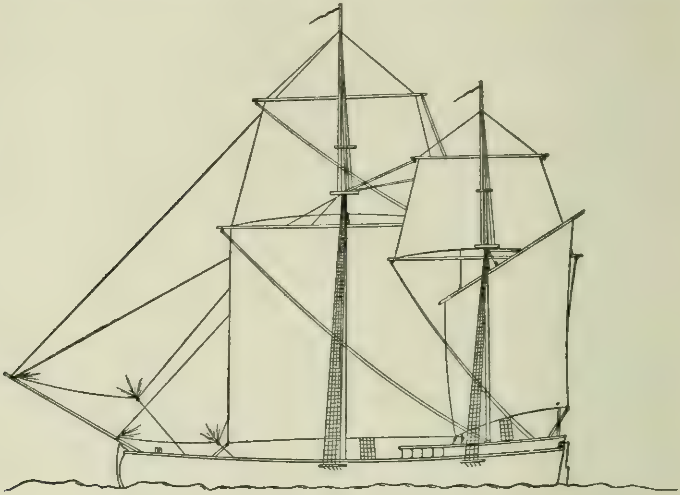
THE LUGGER.

masts both square-rigged. A brigantine differs from the brig in having the aftermast fore-and-aft rigged.

The vessels having only the fore-and-aft rig are the sloop and schooner. The sloop has but one mast; the schooner has two or more. Schooners having five, six, and even seven masts, have been constructed during the past few years.

At the time of the settlement of America, early in the seventeenth century, the largest ocean vessels were the full-rigged ship and the bark; the brig or brigantine of less than 100 tons burden was more frequently used. The coasting vessels most used by the English were the sloop, the lugger, and the ketch. The lugger had one or

two masts, each rigged with square or lug sail. The ketch had two masts—"one tall mast, with two or more crossed yards, set well back from the bow toward amidships, and a smaller mast, also with square sails, nearer



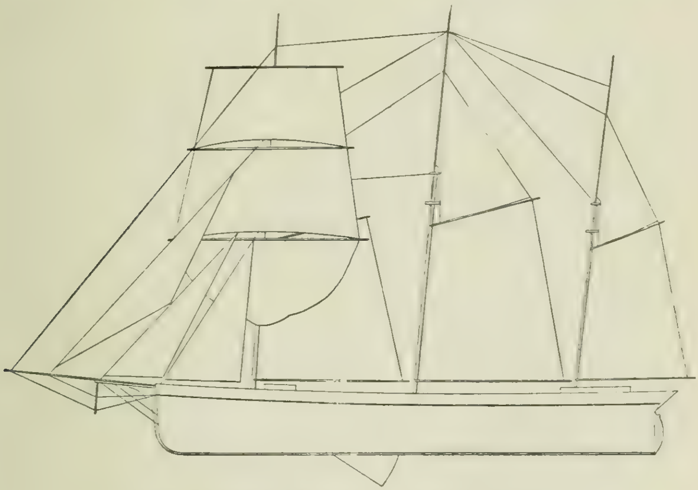
THE KETCH.

the stern."[1] The chief merit of the ketch was that there were two sails on each mast, instead of one heavy, unwieldy lug sail. In some ketches there were both square and fore-and-aft sails in the rigging. The American colonists used the ketch for their coasting trade, until they designed the far more serviceable schooner. The ketch was a slow vessel, and its square sails were handled with difficulty upon its narrow deck.

The first schooner was built in 1713 or 1714, by Captain Andrew Robinson, at Gloucester, Mass., and is sometimes called the Gloucester schooner. It had two masts,

[1] Marvin, "The American Merchant Marine," p. 22.

each bearing a fore-and-aft sail, there being a jib sail forward. The lines of the schooner were sharper than those of its predecessors; it could sail faster and closer to the wind, and could be managed by fewer hands than the square-rigged vessels required. The economy and the efficiency of the schooner were soon recognized in America, especially in the coasting trade. The vessels used for the transoceanic trade did not abandon the square sails after the appearance of the schooner, but modified their rigging by using both square and fore-and-aft sails. According to Marvin:[1] " For many years after 1813 the



THE THREE-MASTED SCHOONER *Hall*.

American schooner represented a compromise. The prevailing type was the so-called topsail schooner, carrying the Robinson fore-and-aft foresail and mainsail, but bearing on the foremast a lower and a topsail, and sometimes

[1] "The American Merchant Marine," p. 23.

a topgallant yard,[1] and thus combining the good qualities of the fore-and-aft and the square rig. It was the topsail schooners which were the favorite privateers of the Revolution and the War of 1812."

The character of the shipping constructed in America near the close of the colonial period is illustrated by the figures for 1769, during which year 113 square-rigged vessels and 276 sloops and schooners were built. The tonnage of these 389 vessels was 20,001.

Reference is here made to but a few of the leading types of sailing craft, and to only the most important changes in the rig and construction. At the beginning of the seventeenth century the ships were of the caravel type of construction, with a high cabin structure above the deck aft and a high forecastle forward. These superstructures lessened the seaworthiness of the ship and made sailing against opposing winds slow, and, in the case of storms, dangerous. During the seventeenth and eighteenth centuries the depth of the ships was increased, and the practice of constructing cabins above deck was gradually abandoned.

The main features of the history of the sailing vessel during the nineteenth century were (1) the growth in size and the improvement in the sailing qualities of the square-rigged ship; (2) the development of numerous important "packet lines" with vessels sailing at regular intervals to handle the mails and to carry the large traffic that accompanied the growth of the United States after the War of 1812 to 1815; (3) the development of the schooner from a two- or three-masted to a four-masted wooden vessel, and then to a five-, six-, or seven-masted steel vessel;

[1] The first or lowest sail on the mast is called the lower sail, the second one the topsail, the third the topgallant. The large full-rigged ship may carry a fourth or royal sail, and even a fifth or skysail. The lower sails on the fore and main masts were the foresail and mainsail.

(4) the gradual and steady substitution of steamers for the ship and the schooner in both oversea and coastwise commerce.

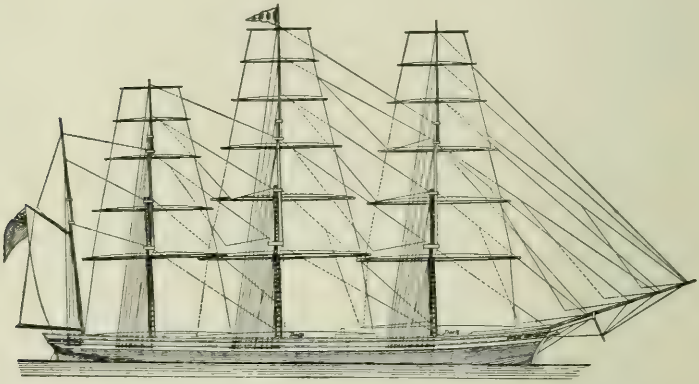
At the beginning of the nineteenth century the sailing vessel was still relatively small; 300 tons was considered a large register even for a full-rigged ship, although ships of larger tonnage had been constructed. At Salem, Mass., for example—the center of our important East India trade during the half century following the Revolutionary War—the largest ship in the merchant fleet as late as 1825 was of 400 tons. The rich trade of Salem with the far East was built up by the use of ships averaging less than 300 tons.

The traffic between New York and England first led to the construction of the large sailing ships, as it has later caused the largest steamers to be built. At the close of the War of 1812–15, ships of 400 to 500 tons were put into service, and the size was steadily increased until about 1840, when double-decked ships of 1,000 tons were being sailed. The first three-decker, the *Guy Mannering*, was built in 1849, with a tonnage of 1,419. Between 1850 and 1860 a ship of 1,500 tons gross register was not phenomenally large; indeed, some as large as 2,500 tons were launched and successfully operated. After the discovery of gold in California the traffic between our Atlantic and Pacific seaboards, as well as the transatlantic business, caused a demand for spacious and swift sailing vessels.

The large ships built at the close of the War of 1812–15 were those constructed for the American transatlantic lines that operated their ships according to a fixed schedule of sailings. The vessels connected with these lines carried the mails, and for that reason they were called "packet" ships. The lines were called packet lines, and they date from 1815, when the celebrated Black

Ball Line from New York to Liverpool was started. Numerous other important packet lines were soon afterwards established to handle the increasing travel and traffic that resulted from the growth of the United States.

The square-rigged vessel reached the acme of its development in the "clipper" ships which began to be constructed about 1845. The clipper was built with sharp lines to give it the maximum speed, and it had a long overhanging stem or prow from which the ship derived



The Square-Rigged Ship, *The Great Republic.*

its name. (See cut shown above.) As the first vessels of this type were built in Baltimore, the term "Baltimore Clipper" was sometimes employed. The two causes that led to the construction of the first clipper ships were the trade with China and India, and the competition of the steamships in the North Atlantic trade. In order to hold the trade with the far East against the competition of foreign sailing vessels, and to retain the traffic between the United States and Europe against the rivalry of the steamship lines that were being rapidly es-

tablished, the American shipwrights designed the fleet clipper ships which for a decade and a half were the pride of American sailors. The demand for clipper ships was greatly increased by two other events: the rush of people, in 1849 and 1850, to the newly discovered gold fields of California put a premium on speed, and clipper-ships were rapidly constructed for the New York and San Francisco service via Cape Horn. When the demands of that traffic had been met, the Crimean War broke out in 1854, and France and the United Kingdom bought a large tonnage of American ships to use as transports. In 1855 there were 583,450 gross tons of shipping constructed in American yards, a greater total than has been reached any year before or since.

Since 1858, and particularly since the close of the Civil War, the construction of square-rigged vessels—ships, barks, barkentines, and brigs—has tended to fall off, the preference of builders being given to schooners. Since 1885 almost all the sailing vessels launched have been schooner-rigged. The huge five- to seven-masted sailing vessels constructed from 1899 to the present time have mainly been schooners, and they bear little resemblance to the typical wooden sailing vessel of fifty years ago. The largest schooner afloat (there are others nearly as large) is the *Thomas W. Lawson*. It has seven masts, and measures 5,218 tons gross and 4,914 tons net. It can carry from 7,000 to 8,000 tons of cargo. The length over all is 375 feet, the beam 50 feet, the draft loaded 23 feet. The masts are 195 feet high, the first 135 feet being steel and the top 60 feet wood. The maximum possible spread of sail is 43,000 square feet, an area about equal to an acre. Dummy engines are employed to handle the sails, to work the rudder, to load and unload the cargo, and for numerous other purposes. The vessel is as up-to-date in its appointments as is the most mod-

ern freight steamer, about the only difference between the two vessels being in the motor power employed.

The rôle of the sailing vessel in American commerce is, however, a narrowing one; and it is not probable that even the construction of huge steel schooners will enable the sailing vessel to hold its own in competition with steam power. Although the mercantile marine under the flag

THE SEVEN-MASTED SCHOONER, *Thomas W. Lawson.*

of the United States contains a larger proportion of sail tonnage as compared with steamers than is true of the marines of most countries, five eighths of our tonnage engaged in foreign trade and three fifths of our domestic fleet consist of steamers. The substitution of steam for sail has been going on steadily for a long time, and during recent years the change has been especially rapid. From 1900 to 1904 our sail tonnage in the foreign trade

fell off 140,740 tons gross, while the steam tonnage increased 212,814 tons gross. During the same four years the sail tonnage of our domestic fleet, exclusive of canal boats and barges, increased 202,985 tons, while the figures for the steamers rose 715,103.

The total sail tonnage of the domestic fleet has not yet begun to decline, but the rapid growth of our domestic fleet is due mainly to the construction of steamers. Indeed, there has been less increase in the sail fleet than the figures just given indicate, because the large schooner-rigged barges on the Great Lakes, although always towed, are classed as sailing vessels on account of their rig. The steam tonnage of our domestic fleet in 1880 was 1,000,000 tons; in 1895, 2,000,000 tons; and in 1904, 3,000,000 tons; the gain during the twenty-five years having been 200 per cent; whereas the tonnage of our enrolled sailing vessels, including barges, was 2,278,861 tons in 1904, the increase since 1880 having been only 43 per cent. The sail tonnage is still increasing absolutely, but is declining in comparison with steam tonnage.

In the merchant marine of the world as a whole, the tonnage of steamers first exceeded that of sailing vessels in 1893; but during the following eleven years the change was so rapid that the sail tonnage of 1904 was only three fourths that of 1893, while the steam tonnage had nearly doubled. At the present time about one fourth of the world's tonnage is sail, and about three fourths steam. The speed and regularity of the steamer's movements so exceed those of the sailing vessel that fully nine tenths of the tonnage of the world's commerce is now handled by steamers.

The sailing vessel is giving way to the steamer, because the steamer is more efficient and more economical. Although the motor power of the sailing vessel costs nothing, and a smaller crew is required to operate a sailing

vessel than a steamer of equal tonnage, these advantages are more than offset by the slow average speed of the sailing ship, and the uncertainty as to the time of delivering cargo assigned to a ship whose movements depend upon winds and currents instead of upon its own propelling power. At the present time a steamer is considered to have on the average four times the efficiency (as a freight carrier) of a sailing vessel of equal tonnage. This is what enables the steamer to take traffic away from the sailing vessel, despite the disadvantages which the steamer has as regards the cost of coal, the large amount of space taken up in the steamer for coal bunkers and machinery—one fourth to one third of the hull capacity—and the somewhat larger crew required.

As will be shown in the following chapter, mechanical improvements have reduced the cost of steam power to a surprisingly low figure. This fact is illustrated by the new steamers put into service between New York and San Francisco. Some of these steamers can carry 10,000 tons of cargo and 2,500 tons of coal. They have quadruple expansion engines, with a boiler pressure of 210 pounds to the square inch; and their coal consumption, when running at nine knots an hour, is only 40 tons a day. When the Panama Canal is available for use these vessels will consume about 1,000 tons of coal in transporting 10,000 tons of freight the 5,000 miles from New York to San Francisco. In other words, it will require only one tenth of a ton, or thirty cents' worth of coal, to carry a ton of cargo 5,000 miles.

Until within a few years it was thought that the sailing vessel would always be used exclusively for certain classes of bulky goods carried over long routes; such as traffic in nitrate of soda from Chile to Europe, grain and lumber from the Pacific coast of the United States to Europe, and the trade between our Atlantic coast and

Australia; but even in the trade over these routes the steamer is competing successfully with the sailing vessel. When the Panama Canal is opened the steamer will still further narrow the sphere of the sailing vessel.

The sailing vessel will doubtless be used for some time to come, especially by the people of the United States, but the sailing vessel will probably be employed mainly for two classes of service. One of these fields of usefulness will be that part of our coasting trade that cannot readily be so organized as to be performed by regular lines of steamers. The other use to which we shall continue to put the sailing vessel will be that of performing the irregular or skirmish work of international trade—such, for instance, as that now carried on between the Gulf ports of the United States and the river Plata. In the earlier development of such a traffic the sailing vessel is a convenient agent; but when the trade becomes larger, and the exchange of commodities between the two sections becomes regular and continuous, a line of steamers will be established, and most of the sailing vessels will be withdrawn from that service.

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# CHAPTER III

## THE HISTORY OF THE OCEAN CARRIER—THE STEAMSHIP

The steamship has had a briefer but more complicated technical evolution than the sailing vessel. The main phases of the development of the present-day steel steamer may be summarized by a brief description (1) of the application of the power of propulsion, first by paddle wheels, then by the screw; (2) of the evolution of the marine engine by which the power is generated; and (3) of the change from wooden to iron and to steel hulls, and of the equipment of ships with appliances to add to the safety and comforts of travel.

The practicability of using steam power to propel ships was demonstrated by Robert Fulton in 1807, when he ran the *Clermont* from New York City to Albany. The use of steamboats on rivers and bays became general during the succeeding ten years, but it was thirty years after the *Clermont's* first trip before it was demonstrated that the steamship could be used with commercial success in the transoceanic service. As early as 1819 a sailing packet of 380 tons, the *Savannah*, was equipped with a ninety horse-power horizontal engine and with paddle wheels. This ship crossed the Atlantic from Savannah to Liverpool in twenty-five days, during eighteen of which she used steam power; but the next year the engine was taken out of the ship. The first vessel to cross the ocean all the way under steam was the *Royal*

*William,* which made the trip from Quebec via Nova Scotia and the Isle of Wight to London in 1833.

The first steamship built for the transatlantic service was the *Great Western*, constructed for the Great Western Railway interests, and launched at Bristol, England, in 1837. Her first trip was made from Bristol to New York, April 8 to 21, 1838. The same year three other British steamers—the *Royal William* (No. 2), the *Sirius*, and the *Liverpool*—made trips across the Atlantic under the management of the Transatlantic Steamship Company, of Liverpool, and the success of these runs led to the establishment of a regular service. The following year the great Cunard Company was organized as the third British transatlantic steamship company. It put three steamships in operation in 1840, and its able management, aided by the Government's strong support, soon gave it the leadership of all the British companies, a rank which it still holds upon the Atlantic.

The early steamers were wooden vessels propelled by paddle wheels. The gross tonnage of the *Liverpool* was 1,150, of the *Great Western*, 1,340 tons, and the average tonnage of the first four Cunard steamers (launched in 1840) was 1,139 tons each. The ships were a little over 200 feet long, and were of about 35 feet beam. They had an average speed of 8 to 10 knots an hour, and under favorable conditions took about two weeks to make the passage from port to port. Frequently three weeks were required for the trip westward. The engines were all of the side-lever type described below; those of the *Liverpool* had an indicated horse power of 468, those of the *Great Western* 750 horse power, and the Cunarders 740. A comparison of these figures with the data given later of the measurement, speed, and engine power of the large liners of the present day, will show clearly what progress has taken place in marine architecture.

The general substitution of the screw propeller in place of paddle wheels came later than might have been expected. In 1836, John Ericsson, who subsequently achieved great fame and revolutionized naval architecture by building the *Monitor*, and Francis P. Smith, an English farmer working independently, each successfully applied the screw to the propulsion of ships; and in 1839, Smith's little ship, the *Archimedes*, of 237 tons burden and 80 horse power, made a most favorable impression, and led to the adoption of the screw on several small naval vessels, and on the large iron merchant ship the *Great Britain*, then building. Naval architects welcomed the screw because it was placed below the water line, and was not exposed to the fire of the enemy, as were the huge paddle wheels.

Most builders of merchant vessels continued to prefer paddle wheels until after 1850. Before that date the side-wheel steamers made better speed than the screw steamers did. This was due partly to the designs of the early screws, and also to the fact that the marine engines had been designed with reference to driving paddle wheels. The screw propeller necessitated a differently constructed engine, which builders required some time to design and supply. The *Great Britain*, the first large transatlantic ship to use the screw, began running in 1844. Numerous small steamers both in the United States and Europe were constructed with screw propellers before 1850; but it was after that date before the managers of the large ocean lines became convinced that the screw was preferable to the paddle wheels. The famous Collins Line, in the United States, ordered four large expensive mail steamers in 1848, and put them into service in 1850, but they were of wooden construction and had paddle wheels. The Inman Line, of Liverpool, founded in 1850, began operating screw steamers of iron con-

struction at the close of that year, and the Allan Line began running ships of like character in 1854. The conservative Cunard Company put the first screw steamer, the *Persia*, into the Atlantic service in 1862, during which year the company built their last paddle wheel ocean liner. The famous *Great Eastern*, completed in 1859, was provided with paddle wheels and a screw and six masts.

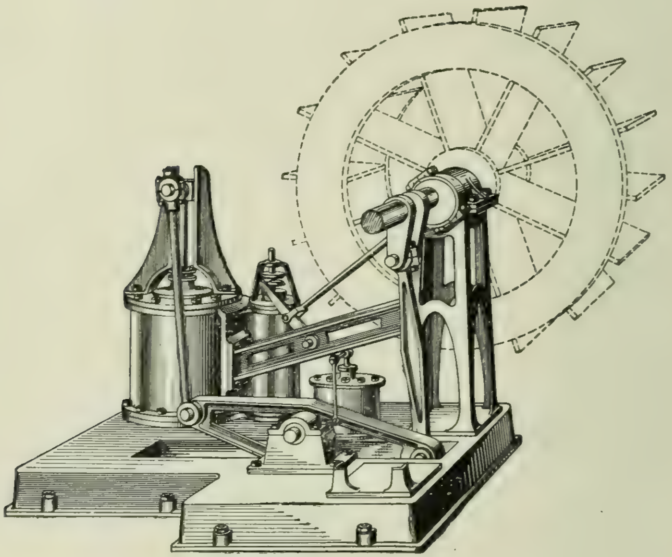
It was twenty-three years after the construction of the *Archimedes* before the paddle wheels were finally abandoned in favor of the screw by the builders of ocean liners. American companies were slower in adopting the screw propeller than the British companies. This, doubtless, was due in part to our adherence to wooden hulls until after the British builders had adopted iron construction.

The use of twin screws instead of a single propeller dates from about 1880, and naturally began with war vessels. The merchant vessels in use before 1880 were not large enough to warrant the installation of two sets of engines. The war ships, being built with reference to speed, safety, and certainty of control, found the twin screw of special advantage. The first twin screw merchant vessel in the transatlantic trade, the *Notting Hill*, began running in 1881. The *City of New York*, placed in service in 1888 by the Inman Line, was the first of the large ocean liners to use twin screws; but since that date all large passenger steamers have had two propellers.

The use of more than two propellers is rendered undesirable by the fact that not even the largest passenger steamers have found it profitable to carry more than two sets of engines. The gain in speed and power resulting from the third set of engines does not compensate for the extra expense of installation and maintenance and for the space occupied. The substitution of the compact

turbine engines for the reciprocating engines now in use, which seems probable, will be accompanied by the use of three or more screws.

The most important phase of the technical history of ocean transportation is the evolution of the marine engine. The power that can be economically generated within the ship limits the size and the speed of ocean carriers. The *Great Eastern* proved a failure forty-five years ago, for various reasons, but mainly because her engines were unable to supply the power needed. To-

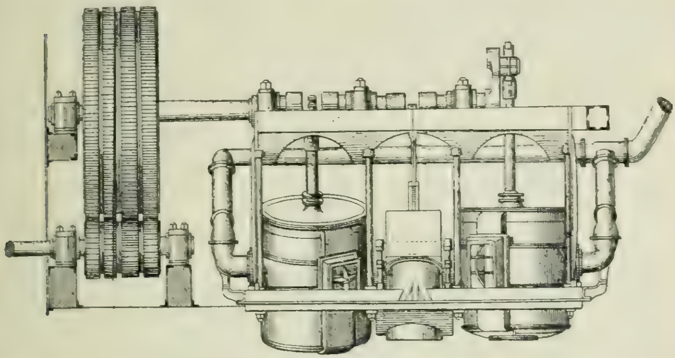


Side Lever Type of Marine Engine.

day vessels as large as the *Great Eastern* are profitably run at double the speed that steamer could maintain.

In adapting the steam engine to the work of propelling ships, numerous types of engines were constructed,

but only the more important ones need be considered in this chapter. The engine most used for driving paddle wheels was the side-lever type, shown in the illustration. The cylinder was placed upright, and the lever or beam connecting the piston rod with the rod attached to the



THE OSCILLATING GEARED ENGINE.

crank shaft of the paddle wheels was placed at the side of the cylinder. The overhead beam engine so frequently seen on side-wheel ferry boats and river and sound steamers was not employed on ocean vessels, because it tended to make the ship top-heavy.

The side-lever engines constructed at the beginning, about 1840, had cylinders 60 to 72 inches in diameter, a piston speed of 170 to 190 feet per minute, and were supplied with steam from boilers carrying pressures of only 10 or 12 pounds per square inch. The indicated horse power was from 400 to 750, and the speed was from 7 to 9 knots per hour. The first engines had surface condensers, as engines now do, but from 1840 until 1860 the jet condensers were preferred, although they had the disadvantage of introducing salt water into the boilers. With boiler pressures of more than 35 pounds the jet

condenser cannot be used, because the heat of the steam causes the boiler to become coated with sulphate of lime.

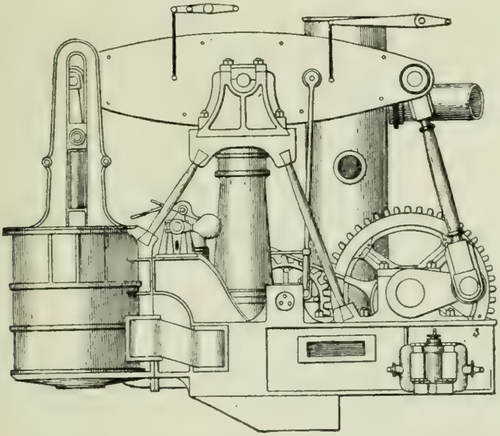
The last large ocean vessel to be fitted with side-lever engines was the *Scotia*, in 1862, of the Cunard Line, which had boilers carrying a pressure of 25 pounds per square inch. The huge cylinders were 8 feet 4½ inches in diameter, had a piston stroke of 12 feet, a piston speed of 360 feet per minute, an indicated horse power of 4,000, and gave a vessel speed of 13½ knots per hour.

During the period of transition from side wheels to the screw propeller, engines with oscillating cylinders were installed in numerous ships. The piston of the cylinder was attached directly to the crank shaft, without a lever or connecting rod. Engines of this type were used on the *Adriatic*, of the Collins Line, on the famous *Great Eastern*, both in 1858, and on other vessels. The oscillating engines were successfully applied to driving paddle wheels and screw propellers, but, when used to drive a screw, gearing was necessary to secure the requisite speed for the propeller shaft, which needed to revolve from three to six times as fast as paddle wheels.

The engines constructed for screw steamers were of two general types, geared and direct-acting. Between 1850 and 1860 the geared engine was more frequently used, mainly because the boilers as then constructed had such a low pressure that the piston speed could not be made high enough to drive the screw as rapidly as was required without gearing. The geared engine was made in various designs. The arrangement of a "beam" engine of 1855 is indicated in the illustration.

The marine engine now universally used is the inverted direct-acting, in which the cylinders are placed inverted above the screw shaft, with the cranks of which the connecting rods from the pistons are directly attached. The first Atlantic steamer to have an engine of

this type was the *Canadian*, of the Allan Line, in 1854. After this date the direct-acting engine was gradually adopted, but it was given several other designs than the inverted. Many steamers placed the cylinders horizontally at right angles to, and on a level with, the propeller shaft. These were called trunk engines, because the piston was large and hollow and had the connecting rod

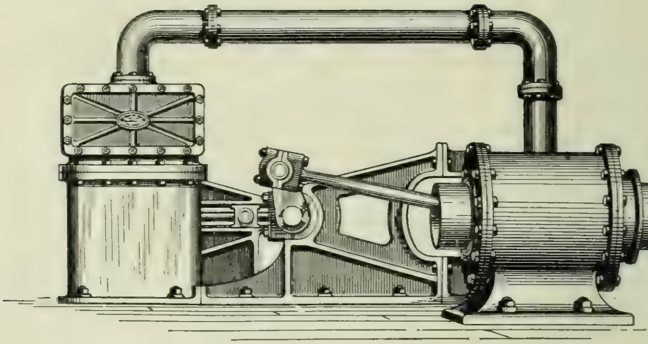


Geared Beam Engine, Constructed in 1855.

attached to the center of the hollow trunk. In another arrangement the cylinders were placed upright, the piston acted upward and was attached by a long return connecting rod with the shaft placed either above or below the cylinders. Another device was the inverted diagonal arrangement of cylinders. A popular engine was one combining both horizontal trunk and inverted engines acting upon the same shaft. It was not until after 1870 that the inverted direct-acting engine came to be exclusively used, and it then supplanted the other designs, because it was the best arrangement for the cylinders of the compound engine.

The compound engine was successfully used in 1854 on the Pacific steamship *Brandon*, whose boilers carried a pressure of 42 pounds. However, the compound engine did not make much headway until 1870, by which time a boiler pressure of 50 pounds to the square inch was not considered extraordinary. The steamship *Holland*, 1870, was the first vessel to adopt a compound engine for the transatlantic trade. Its boiler pressure was 60 pounds.

In the arrangement of the cylinders and cranks of the compound engine various designs were followed; but with the exception of the gradual improvements in boiler construction whereby the steam pressure was raised to 90 and 100 pounds, there was no change that requires notice here made in the marine engine before 1881, when the triple-expansion engine made its appearance in the Australian liner *Aberdeen*. In 1884, the Wilson Line steamer, the *Martello*, inaugurated the use of the triple-

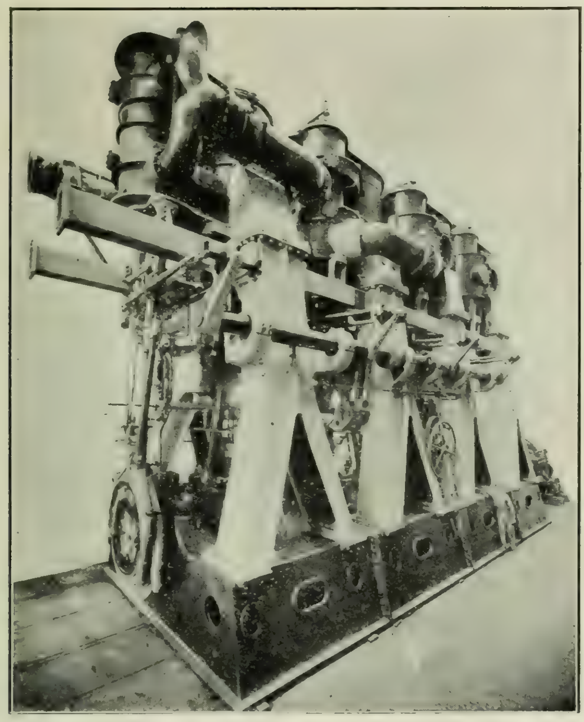


THE TRUNK ENGINE.

expansion engine in the Atlantic service. Other vessels with similar engines soon followed.

The quadruple-expansion engine dates from 1894, when the American Line ships, the *St. Louis* and the *St.*

*Paul*, were put into service. The efficiency and economy obtained from quadruple expansion are somewhat greater than can be secured from triple expansion, but the adop-

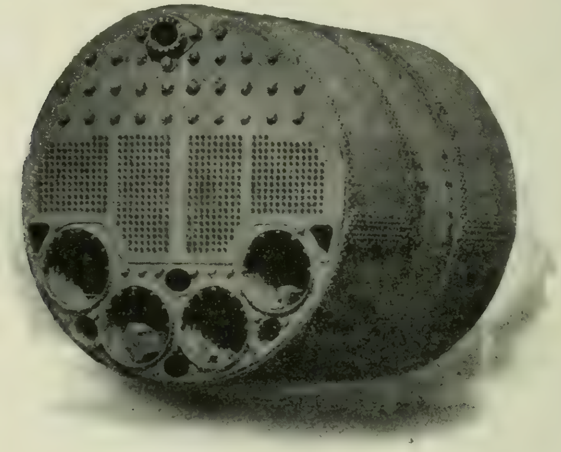


THE QUADRUPLE-EXPANSION INVERTED DIRECT-ACTING MARINE ENGINE.

tion of quadruple engines does not mark an especially important step forward.

Several references have already been made to the boilers of marine engines, and to the limitations which the low pressure of the early boilers placed upon the improvement of the engine. The power is applied in the

cylinder, but as the power is generated in the boilers, they determine the amount of available energy. In the flat-sided, box-shaped boilers used before the introduction of the cylindrical boiler with internal furnaces in 1868, high pressure was impossible. Accordingly, from 1840 to 1860 most marine engines were designed with reference to a steam pressure of thirty pounds or less to the



THE MARINE BOILER.
Showing Arrangement of the Furnaces and Fire Tubes.

square inch. The cylinders were of large diameter and the piston speed slow. When the introduction of the screw called for increased piston speed, and the invention of the compound engine also made higher steam pressure necessary, the boiler was so designed as to carry higher pressure and to provide greater heating surface.

The circular boilers used from 1870 to 1880 permitted the pressure to be raised to 100 pounds by 1880. When the introduction of triple-expansion engines caused

a demand for higher pressure, the corrugated furnace now used was adopted. The cylindrical boiler, with three internal corrugated furnaces and with return horizontal tubes, is the one now almost universally used on merchant steamers. Steam pressures of 200 to 225 pounds are customary. On naval vessels a different type of boiler, having water tubes surrounded by fire, has been used to a large extent. The water-tube boiler is more efficient, but is more expensive to construct and to maintain; and its use has thus far been confined mainly to war vessels, where cost is a minor consideration.

Without giving in detail the numerous minor improvements by which the marine engine has been brought to its present state, the results of the improvements may be shown by the following table, taken from "The Atlantic Ferry," by A. J. Maginnis, which shows the power obtained from the combustion of one pound of coal in the furnaces:

TABLE SHOWING THE EFFECTIVE POWER OBTAINED BY MARINE ENGINES AT DIFFERENT DATES FROM THE COMBUSTION OF ONE POUND OF COAL

In 1840, 1 lb. coal propelled .578 displaced tons at 8 knots, of which .057 was earning weight.

In 1850, 1 lb. coal propelled .6 displaced tons at 9 knots, of which .16 was earning weight.

In 1860, 1 lb. coal propelled .82 displaced tons at 10 knots, of which .27 was earning weight.

In 1870, 1 lb. coal propelled 1.8 displaced tons at 10 knots, of which .9 was earning weight.

In 1880, 1 lb. coal propelled 2.1 displaced tons at 10 knots, of which 1.05 was earning weight.

In 1890, 1 lb. coal propelled 3.33 displaced tons at 10 knots, of which 1.93 was earning weight.

In 1898, 1 lb. coal propelled 3.5 displaced tons at 10 knots, of which 2.1 was earning weight.

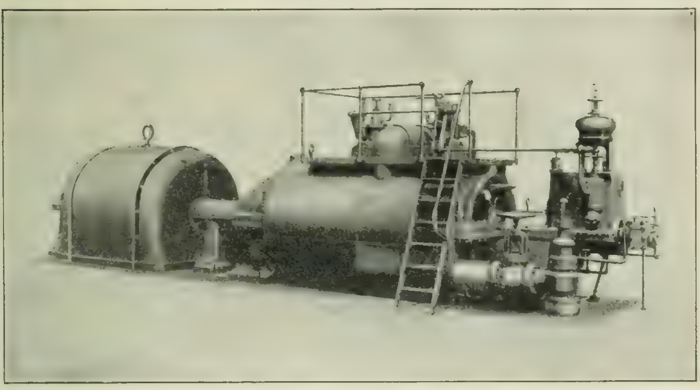
Seventy years of development have brought the reciprocating marine engine to high efficiency, but its place

may possibly be taken in the future by a radically different type of engine, the turbine. The successful use of the turbine engine for driving dynamos and pumps has led to its being successfully tried on ocean vessels, both merchant and naval ships. The Cunard Steamship Company in 1905 equipped the huge steamer *Carmania*, of 30,000 tons displacement, with turbine engines having an indicated horse power of 21,000. The two Cunard steamers now building are to be the largest and fastest vessels afloat, and will be equipped with turbine engines. The engines in each vessel are to have about 70,000 horse power. At the close of 1905 there were said to be stationary and marine turbine engines in operation with an aggregate horse power of 700,000.

There are two general types of steam turbines: one, invented in 1883 by De Laval, in Sweden, and another in 1884, by Parsons, in Sweden. Since their invention both kinds of turbines have undergone steady improvement, and both may be expected to be given greater efficiency as the result of future inventions. The description of the steam turbine engine contained in the Census volume published in 1902 (vol. x, Part IV, p. 397) is clear and concise, and may well be reproduced here:

"In both the De Laval and Parsons steam turbines power is generated by the impact of a jet of steam upon buckets on the periphery of a revolving disk. The essential differences between the two types of motors are these: The De Laval turbine has a single disk, with several steam jets or nozzles. The nozzle has a divergent aperture in which the expansion of the steam takes place. The single turbine disk revolves at a high rate of speed, say from 10,000 to 30,000 revolutions per minute, according to the size of the motor, this speed being reduced to about one tenth on the main shaft by means of accurately cut spiral gears. The Parsons type of turbine, on the other hand,

has a series of disks mounted upon a common shaft, and alternating with spiral blades fixed within the casing of the shaft. There are buckets, or cups, upon both the revolving disks and the fixed blades, the fixed buckets being reversed in relation to the moving cups. The steam, admitted first through a set of stationary blades or buckets, impinges at an angle upon the first rotating disk and imparts motion, passing thence through another set of fixed blades to the second disk upon the main shaft, and thus



A Parsons Turbine Engine.

through the entire series of alternately fixed and rotating buckets. The area of the passages increases progressively to correspond with the expansion of the steam as it is used on the successive disks. The expansion of the steam is accomplished in the turbine itself, instead of in the nozzles, as in the De Laval motor. There is but a single shaft, instead of the two in the De Laval type, and the buckets in a given size of Parsons turbine number about 30,000, as against about 350 in a De Laval motor of the same size."

Whether the same amount of power can be secured

more economically by means of the turbine than by means of the reciprocating engine is apparently not fully established, although greater economy is claimed for the turbine; but the turbine has certain advantages, other than power efficiency, that are valuable. The turbine engine being much more compact than the reciprocating, occupies less space and weighs less. The friction of its moving parts is less, and it is without the vibration which the reciprocating engine has. These advantages of the turbine give it special merits as a marine engine, in which economy of space and weight and reduction of vibration to a minimum are specially important considerations.

The third phase of the technical history of the modern steamship is concerned with the hull. The lines to be followed in constructing a hull to secure seaworthiness and speed were worked out by the builders of sailing vessels during the first half of the nineteenth century, and when the construction of steamships began, about 1840, there were no important changes necessary in the design of the hull.

The first steamships had wooden hulls; and, as was true of the substitution of the screw for the paddle wheel, the change from wooden to iron vessels was brought about slowly. The first ocean-going iron vessel was the *Rainbow*, a little paddle-wheel ship of 580 tons and 180 horse power, built at Liverpool in 1837–38. The vessel that did most to bring the iron hull into favor was the *Great Britain*, a ship phenomenally large for its time, of 3,270 tons gross, built in 1839–44. The hull was divided into six water-tight compartments, and was so strongly built that it lay stranded on the Irish coast, without serious damage, for eleven months in 1846 and 1847. The vessel was kept in service on various routes for nearly forty years.

Several causes delayed the general adoption of iron hulls. Until 1860 the people of the United States led Great Britain and other countries in the tonnage of shipping annually constructed, and as wood was abundant and iron was expensive in the United States, our builders adhered to wooden construction much longer than other countries did. The British Government, always conservative, did not favor iron hulls for its navy until after 1850. Until 1852 the British mails could be carried only in wooden ships. Some of the large English steamship companies preferred wooden ships as late as 1860. The Cunard Company built its first iron ship for the Atlantic service in 1856.

The construction of iron ships made steady though not rapid headway in Great Britain during the decade of 1850–60. Thirty per cent of the British tonnage was iron in 1860, and after that date there was but a small wooden tonnage launched. At the present time over ninety-nine per cent of the tonnage of the shipping of the United Kingdom is of iron or steel construction. In the United States, on the contrary, the construction of iron ships made but little headway until after 1870, and since then the change from wood to iron has been so slow that, in 1904, fifty-eight per cent of the tonnage under the American flag was of wooden vessels. It can, however, only be a question of time when wood must give way to metal in shipbuilding, because of the unquestionable superiority of iron and steel ships.

The first change in the material used in the construction of hulls was from wood to iron; the second, was from iron to steel. British builders began to use steel shortly before 1880; and in 1886 the tonnage of steel ships constructed exceeded the figures for iron. Since 1886 the total tonnage and annual construction of iron ships in the United Kingdom has steadily declined; while the figures

for steel vessels have risen, until at the present time over four fifths of the total shipping of that country consists of steel vessels. Steel has now almost displaced iron in the construction of hulls in the shipyards of all countries, and as existing iron ships wear out, their places are taken by steel vessels.

The hull of the modern steamer is divided by bulkheads into water-tight compartments, and is constructed with a double bottom within which water ballast may be carried. The ship carries dynamos, machinery for making ice, for handling cargo, for steering the vessel, and for many other purposes. Almost every year sees some new equipment added to the fitting of the already highly complex and efficient ocean carrier.

The technical progress made in the construction of ocean vessels can be stated most satisfactorily by a brief description of the *Minnesota*, constructed at New London, Conn., and completed in 1905. This, and its sister ship the *Dakota*, were built for the Great Northern Steamship Company to carry freight and passengers between Puget Sound ports and transpacific countries. They are the largest ships ever built in America. Their gross tonnage is 20,718, and their net 13,324 tons, and, with the exception of a few vessels on the North Atlantic, were the largest vessels afloat in 1905. These vessels are 630 feet in length over all, 73 feet 6 inches beam, and 56 feet in depth from the keel to the upper deck amidships. Although intended mainly for the transportation of freight, each vessel has accommodations for 250 cabin, 68 second-class, and 1,500 steerage passengers. The hull is constructed with 32 water-tight compartments, and there are nine decks. These vessels have a speed of about fifteen knots an hour.

The Cunard Steamship Company, of Liverpool, is constructing two vessels intended to exceed in size and speed any others that they have thus far built. These vessels,

which will be completed in 1907, are to be nearly 800 feet in length, and are to be propelled by four screws operated with turbine engines having 70,000 horse power. They are to have a speed of 25 knots per hour, and are to be able to maintain an average speed of 24½ knots per hour for the transatlantic voyage.

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# CHAPTER IV

## WAYS AND TERMINALS OF OCEAN TRANSPORTATION

The oceans provide the great highways of international trade, which, from port entrance to port entrance, are free and open to all who observe the international rules of the road at sea. Although ocean traffic follows certain rather definite routes, no nation, and of course no company, can convert any route into an exclusive right of way such as a railroad corporation possesses. A few short sections of some frequented routes of ocean traffic—the Suez, Corinth and Kiel canals—are artificial, and subject to tolls, but their use is open to all upon equal terms. This simple but fundamental fact, that the sea is an open highway, causes ocean transportation to be governed by laws different from those controlling the railway service; and the main problems of transportation economics—competition, rates and fares, and government regulation—are radically affected by this difference between the railway and the ocean highway.

The route connecting the shippers of one port with those of another port contains two parts, the ocean section or the main line, and the harbors and approaching channels, corresponding to the railway terminals and yards. These two parts of the ocean route will be considered separately.

The routes followed by ocean ships are determined mainly by the location of the areas between which trade

is being carried on, by the sphericity of the earth, and by the size of the land masses lying between the trading areas. The routes followed by sailing vessels are determined also by the location and direction of ocean currents and prevailing winds. Among the minor causes influencing the routes of both steamers and sailing vessels may be mentioned the absence or prevalence in certain areas of the sea of floating ice, or of severe storms at different seasons of the year. The reader will have little difficulty in giving several illustrations for each of these causes.

On account of the spherical shape of the earth, the shortest distance between any two places on the earth's surface is the arc of a great circle connecting the two points. This fact influences nearly all ocean routes, and particularly those across the North Atlantic and the North Pacific. For instance, Yokohama and San Francisco are in practically the same latitude—i. e., Yokohama lies directly west of San Francisco; but the short route between the places, being the arc of a great circle, curves northward nearly to the Aleutian Islands.

The steamer can usually take the short route, but the sailing vessel must shape its course with reference to the currents and prevailing winds, although by so doing the distance may be greatly increased. In sailing from New York to Rio Janeiro, for example, a vessel will steer eastward with the winds and currents to the vicinity of the Azores, or nearly across the Atlantic, where, a longitude east of Cape St. Roque having been reached, the ship will turn toward the south, and, with the aid of the northeast trade winds north of the equator and of the southeast trades of southern latitude, will readily make the port of Rio Janeiro.

Ocean routes are many in number and of different degrees of importance; there being, as in the case of railroads, trunk lines and auxiliary routes, main lines and

feeders. The following are the most important trunk line routes:

1. The ocean trunk line having the heaviest freight and passenger traffic is the one connecting the northeastern seaports of the United States with the entrance to the British Channel. Upon this North Atlantic trunk route more than one sixth of the world's entire shipping is employed. In order to conform as closely as possible to a great circle, this route skirts the coast of North America northward to the Banks of Newfoundland, and then curves across the Atlantic. The branch lines which unite in this North Atlantic trunk route reach American ports from Canada to the Caribbean, and European ports from the Baltic to the Mediterranean. Vessels plying between Europe and Gulf and West Indian ports take a course but slightly south of this route, and pass comparatively close to the coast of the United States. The route from Great Britain to the Panama Canal via New York is only 323 miles longer than the most direct course.

2. The ocean trunk line ranking next to the one across the North Atlantic is the route from the Eastern United States and Western and Southern Europe via the Mediterranean and the Suez Canal to India, the East Indies, China, and Japan. Before the Suez Canal was opened, in 1869, the ocean commerce of Europe and the United States with Eastern countries was carried in sailing vessels around the Cape of Good Hope, and was small in comparison with the great volume of traffic now passing through the Suez Canal. As sailing vessels cannot navigate the Red Sea, only steamers use the Suez Canal route. This ocean trunk line has an especially large number of branch lines or feeders both east and west of the Canal. From the United States, from the British Channel, and from Mediterranean ports in the West, and from British India and Burmah, the Dutch East Indies, Eastern Australia, French Indo-China,

the Philippines, China and Japan in the East, routes connect with the main line and help to swell the volume of traffic.

3. A third ocean trunk line is the South African. Its Atlantic termini are in Europe and America; its main eastern connections are with the east coast of Africa from Delagoa Bay southward, with Australia and New Zealand, and, for sailing vessels, with the East Indies and the Orient. Some ships on this route from Europe engage in the West African coasting trade, but more do not. A large share, but not all shipping on this line, calls at Cape Town, the most important center of the South African trade. The heaviest traffic over this South African route is carried by the numerous lines of freight steamers running from Northwestern Europe to Australasia. Passenger and mail steamers take the Suez route from the British Channel to Australia; but the distance saved, being less than 1,000 miles, is not enough to cause freighters to abandon the Cape route.

4. Corresponding with the route just described is the trunk line around South America, connecting the eastern and western shores of the North Atlantic with the Pacific coast of the Americas. In addition to the through traffic carried between the Atlantic and Pacific regions over this route, there are carried on, usually distinct from the through traffic, the Pacific coastwise trade, and the trade of Europe and the Eastern United States with Brazil and the countries of the Rio de la Plata.

Vessels engaged in the trade between the countries of the North Atlantic and the east coast of South America do not engage in the through traffic with regions beyond the Straits of Magellan. Several lines of ships ply back and forth between Europe and Brazil and the mouth of the Plata, and some shipping is operated between the United States and those sections of South America; but a large

share of our imports of hides, wool, coffee, and rubber from eastern South America is brought to us in vessels that take cargoes out from Europe to South America, and load there for the United States, where cargo for Europe is readily obtained. This is but one of many triangular routes followed by ocean shipping; it is, however, the most important one.

When the Panama Canal is completed, most of the through traffic via the Straits of Magellan will be diverted to the Isthmian route. Indeed, the main reason for constructing the Panama Canal is to shorten the water route between the countries of the North Atlantic and the Pacific coast of the three Americas.

5. Although the traffic of the Gulf of Mexico and the Caribbean Sea—the two bodies of water which together are often called the American Mediterranean—may be said to be handled over routes that are southern branches and extensions of the North Atlantic trunk line, the present and prospective importance of the trade of the countries along the Caribbean and Gulf littoral afford good reason for placing the routes of that trade in a separate class. The main entrance from the Atlantic to the Gulf is the Florida Strait; the principal gateway to the Caribbean is the Windward Passage, at the east end of Cuba; but the Mona Passage, east of Porto Rico, and other channels to the south, are also used. Vessels enter the Gulf either to handle the grain and lumber exports from the Gulf cities of the United States, or to make the circuit of the Gulf and to share in the general trade of the adjacent countries with each other and with Europe and the North Atlantic ports of the United States. Likewise the ships entering the Caribbean from the United States or Europe call at several ports and make at least a partial circuit. Moreover, there is a growing trade carried on entirely within the American Mediterranean between the Gulf

coast of the United States and the ports to the south. The lines followed by the traffic of the Gulf and Caribbean are so complex that they may be more accurately called a system of routes than a trunk line.

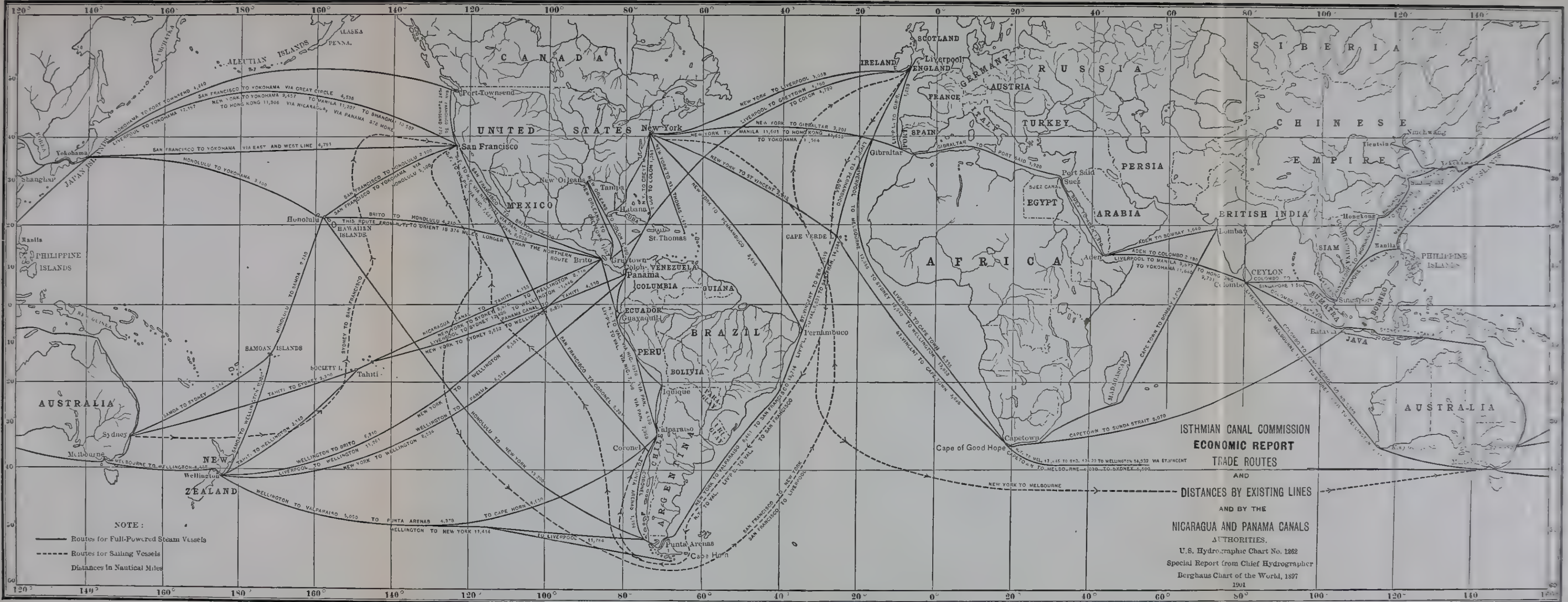
6. The most important trade route within the Pacific is the one connecting North America and Asia. Having for its American termini the chief ports from San Diego to Vancouver, and for its Asiatic focus Yokohama, with extensions from that port of call to other Japanese ports, to Shanghai and other cities of the mainland, and to Manila, this North Pacific trunk line is the route of the rapidly developing transpacific trade. The shortest course across the ocean being by the great circle, that northerly route is taken, except by such line vessels as call at Honolulu and thereby add 964 miles to the voyage from San Francisco across.

7. One other route calls for special mention, the one from the Pacific coast of North America to Australasia. This Pacific coast-Australasian trunk line has for its two main termini in America San Francisco and the Vancouver-Puget Sound section. New Zealand and Australia are its western termini. The sailings over this trunk line are most frequent via Honolulu and Samoa, and thence either to New Zealand or to Australia; but another course much followed is from San Francisco via Tahiti in the Society Islands, and thence either direct to Sydney or to New Zealand, and thence to Australia. The fast-mail route from Australia to Europe is across the Pacific to San Francisco or Vancouver, across the continent by rail to New York or Halifax, and on by express steamer. The freight traffic between Australasia and the western coast of North America is not so heavy as that over the other ocean trunk routes described, and the opening of the Panama Canal will restrict the future growth of the business done by this route.

These seven general routes or trunk lines of ocean traffic are but a few of the many tracks followed by the world's shipping. These tracks cross and recross, and vessels are constantly passing from one trunk route or branch line to another in response to demands of the world's intricate commercial movements. A study of the accompanying chart will serve to locate the most important ocean routes followed by steamers and sailing vessels. The general divergence of steamer and sailing routes in the Atlantic and Pacific is shown. The chart is taken from a report which the author prepared for the Isthmian Canal Commission of 1899–1904, and shows distances by present routes and by those that would have been created by the Nicaragua Canal. The report also compares the distances by the Nicaragua and Panama routes.

This chart thus shows in a general way how the Panama Canal will modify (1) the ocean routes connecting the Pacific coast of the three Americas with the southern and eastern sections of the United States; (2) the routes between the Pacific coast of the Americas and Europe; and (3) the routes connecting the Atlantic and Gulf seaboards of the United States with Australasia, China, and Japan. The Panama Canal will shorten the routes affected by it far more than the Suez Canal did the routes that came under its influence.

The effects which the Panama Canal will have upon the length of ocean routes is illustrated by the following table, giving the distances in nautical miles by the shortest existing commercial route and by the Panama Canal from New York, New Orleans, and Liverpool, to San Francisco (the representative Pacific port of the United States), Iquique (the chief nitrate port in northern Chile), Yokohama and Shanghai (the chief ports of Japan and China), and Sydney (the most important port of Australia):


ISTHMIAN CANAL COMMISSION
ECONOMIC REPORT
TRADE ROUTES
AND
DISTANCES BY EXISTING LINES
AND BY THE
NICARAGUA AND PANAMA CANALS
AUTHORITIES.
U.S. Hydrographic Chart No. 1262
Special Report from Chief Hydrographer
Berghaus Chart of the World, 1897
1901
NOTE:
Routes for Full-Powered Steam Vessels
Routes for Sailing Vessels
Distances in Nautical Miles
CANADA
UNITED STATES
MEXICO
New York
San Francisco
Port Townsend
New Orleans
Tampa
Habana
CUBA
St. Thomas
Greytown
Brito
Colon
Panama
VENEZUELA
COLUMBIA
GUIANA
ECUADOR
Guayaquil
PERU
BRAZIL
BOLIVIA
Pernambuco
Iquique
Valparaiso
Coronel
CHILE
ARGENTINA
Punta Arenas
Cape Horn
ALEUTIAN ISLANDS
ALASKA PENNA.
Honolulu
HAWAIIAN ISLANDS
SAMOAN ISLANDS
SOCIETY I.
Tahiti
AUSTRALIA
Sydney
Melbourne
NEW ZEALAND
Wellington
Yokohama
Shanghai
JAPAN ISLANDS
Manila
PHILIPPINE ISLANDS
SCOTLAND
IRELAND
ENGLAND
Liverpool
FRANCE
GERMANY
AUSTRIA
SPAIN
ITALY
RUSSIA
TURKEY
Gibraltar
CAPE VERDE I.
AFRICA
EGYPT
Port Said
Suez
ARABIA
PERSIA
Aden
BRITISH INDIA
Bombay
CEYLON
Colombo
SIBERIA
CHINESE EMPIRE
SIAM
Hongkong
Singapore
SUMATRA
BORNEO
JAVA
Batavia
Capetown
Cape of Good Hope
MADAGASCAR
NEW YORK TO LIVERPOOL 3,058
NEW YORK TO GIBRALTAR 3,201
GIBRALTAR TO PORT SAID 1,920
ADEN TO BOMBAY 1,640
CAPETOWN TO SUNDA STRAIT 5,070
SAN FRANCISCO TO YOKOHAMA VIA EAST AND WEST LINE 4,791
HONOLULU TO YOKOHAMA 3,400
WELLINGTON TO VALPARAISO 5,050
WELLINGTON TO NEW YORK 11,414
NEW YORK TO MELBOURNE

## TABLE OF DISTANCES VIA THE PANAMA CANAL AND VIA EXISTING ROUTES [1]

| | San Francisco. | Yokohama. | Shanghai. | Sydney. | Iquique. |
|---|---|---|---|---|---|
| | I. II. | III. | III. | VI. | I. |
| New York via present route | 13,714 | 13,564 | 12,514 | 13,658 | 9,221 |
| | | IV. | V. | VII. | |
| Panama Canal | 5,299 | 9,835 | 10,885 | 9,814 | 4,021 |
| Saving by canal | 8,415 | 3,729 | 1,629 | 3,844 | 5,200 |
| | I. II. | III. | III. | VI. | I. |
| New Orleans via present route | 14,114 | 14,929 | 13,879 | 14,625 | 9,621 |
| | | IV. | V. | VII. | |
| Panama Canal | 4,698 | 9,234 | 10,284 | 9,213 | 3,420 |
| Saving by canal | 9,416 | 5,695 | 3,595 | 5,412 | 6,201 |
| | I. II. | III. | III. | VIII. | I. |
| Liverpool via present route | 14,084 | 11,640 | 10,580 | 12,234 | 9,591 |
| | | IV. | V. | VII. | |
| Panama Canal | 8,830 | 12,574 | 13,624 | 12,553 | 6,760 |
| Saving by canal | 6,046 | –934 | –3,044 | –319 | 2,831 |

I. Via Straits of Magellan.
II. Via Pernambuco and Callao.
III. Via Suez Canal.
IV. Via San Francisco.
V. Via San Francisco and Yokohama.
VI. Via St. Vincent, Cape of Good Hope, Adelaide, and Melbourne.
VII. Via Wellington.
VIII. Via Suez Canal, Colombo, King George, George Sound, and Adelaide.

The volume of traffic that will immediately make use of the Panama route will be less than the tonnage that will then be passing the Suez waterway; but the commerce by way of the American Isthmus will in all probability ultimately exceed the volume of trade served by the Suez Canal. The net register tonnage of the vessels that passed through the Suez Canal in 1904 was 13,401,835. The tolls are 8.50 francs per ton net register.

The Panama Canal will be the fourth and greatest

[1] This is a part of a table published on p. 83 of Dr. J. R. Smith's monograph on the "Organization of Ocean Commerce."

of the world's isthmian waterways constructed to shorten ocean-trade routes. The first and most important of the three thus far completed is the Suez Canal, which was begun in 1859 and opened for traffic in 1869. The cost of the canal up to the time of completion was £16,632,953 (about $80,000,000). The length of the waterway from Port Said to Suez is 88 nautical or 100 English miles. Of the 88 nautical miles, 27 miles come within four lakes formed by flooding depressions along the line of the canal, which is a sea-level waterway. The present depth of the canal at low water is 31.1 feet. Work now in progress will increase the depth to 34.4 feet. The Suez Canal was constructed mainly to shorten the ocean distance from Europe and the eastern half of the United States to the East Indies, China, and Japan; and secondarily to give a shorter route to Australia and eastern Africa. The navigation of the Red Sea not being practicable for sailing vessels the Suez route is used only by steamers. The following table gives the distances from Liverpool and New York via the Cape of Good Hope and the Suez Canal to a typical port in India, Java, China, and Australia, and states the number of miles saved by the Canal:

| From | To Bombay. | To Batavia. | To Hongkong. | To Sydney. |
|---|---|---|---|---|
| Liverpool via | | | | |
| Cape Town | 10,985 | 11,513 | 13,406[3] | 12,940 |
| Suez Canal | 6,241 | 8,567 | 9,731 | 12,036[1] |
| Distance saved | 4,744 | 2,946 | 3,675 | 804 |
| New York via | | | | |
| Cape Town[2] | 11,465 | 11,993 | 13,886[3] | 13,420 |
| Suez Canal | 8,165 | 10,491 | 11,655 | 13,960[1] |
| Distance saved | 3,300 | 1,502 | 2,231 | —540 |

[1] Via Colombo and Melbourne.
[2] Including call at St. Vincent.
[3] Via Singapore.

From Liverpool and other north European ports to the East Indies and the Orient the Suez Canal shortens the distances from 25 to 45 per cent; while there is but a small reduction in the length of the routes to the chief ports of Australia. In comparison, it may be noted that the Panama Canal will reduce the length of the ocean route between our two seaboards from 13,714 to 5,209 nautical miles, and effect a saving of 8,415 miles, or over 61 per cent; the distances from New York to the centers of the heavy traffic on the west coast of South America will be shortened fully 50 per cent on the average. The Panama Canal will shorten the ocean voyage from Liverpool to San Francisco 43 per cent, and to Iquique 30 per cent. The route from New York to Australian ports by way of the Cape of Good Hope is shorter than via the Suez Canal and Colombo; the Panama route from New York to Sydney will be 3,844 miles (28 per cent) shorter than the Suez line. Between Australia and the British Channel the Suez route is shorter than the one by Panama, but from New Zealand to Great Britain the American canal route will be 15 per cent shorter than the Suez route.

The Corinth Canal, begun in 1884 and completed in 1893, at a cost of $13,750,000, is a waterway four miles long, connecting the Gulf of Corinth, or Lepanto, with the Gulf of Ægina. It was constructed to save the trip around Morea, the southern peninsula of Greece, and it shortens the distance between the Adriatic and Black Seas about 185 miles, and between the Strait of Messina and the Black Sea 95 miles. The construction of the canal was more expensive than was anticipated, because the rock to be excavated was of extreme hardness. The traffic of the canal has been much less than was estimated, although tolls of only 18 cents per ton and 20 cents per passenger are charged. Most ships of much size prefer the old open-sea route to the shorter canal route, because the navigation of

the canal is somewhat difficult. The bottom width is only 68 feet, 11 inches, the depth 26 feet, 3 inches, and through the rock cut, 326 yards long, the surface of the canal is only 80 feet wide, although the cutting reaches a maximum depth of 260 feet. The currents of air through the canal trench are strong; and, what is worse, high tide in the Gulf of Corinth does not come at the same time as in the Gulf of Ægina, and this causes tidal currents through the canal. Although these tidal currents can be controlled, it does not seem probable that the Corinth Canal will ever succeed in exerting much influence upon the routes of ocean commerce.

The Baltic, or Nord-Ost-See, Canal has been more successful than the Corinth waterway. The Kaiser Wilhelm Canal, as it is officially called, begun in 1887 and completed in 1895, was constructed by the German Government for naval and commercial reasons. It connects the North Sea and Baltic seaboards of Germany by an ocean ship canal lying entirely within German territory, thereby greatly strengthening the German navy. The distance between the ports of the two seaboards of Germany is shortened from 300 to 400 miles, and the dangerous passage through the Skager Rack is obviated. The canal is 61 miles long, and connects Kiel Bay with the mouth of the Elbe River at Brunsbüttel. Its dimensions are: depth, 29½ feet; bottom width, 72 feet; minimum surface width, 190 feet. It has no locks except those at the ends, which are necessary on account of the tides. The waterway is used by a large number of small vessels and by barges; the traffic for the year ending March 31, 1905, consisted of 32,631 merchant craft, with a tonnage of 5,270,477. The tolls and dues amounted to $616,035. The receipts now equal the operating expenses. The traffic and receipts show a steady but not rapid gain, the tonnage increase during the past six years having been from 3,117,840 tons in 1899 to the

figures just given for 1905, a gain of 69 per cent. The canal was constructed for the low cost of $40,000,000, and it is probable that the German Government will keep the tolls low, and seek to stimulate trade and commerce rather than to secure interest on the sum invested in the waterway.

The canals just described have been constructed to shorten ocean routes. Of even greater importance to the trade of their particular port and country are the Amsterdam and Manchester canals, whose purpose is to extend ocean routes from the seaboard inland. The canal from Ymuiden, on the North Sea, to Amsterdam, was opened for traffic in 1876. Its length is 15½ miles, and its dimensions are now being enlarged to a depth of 32 feet, and a minimum bottom width of 165 feet. The tendency of the trade of Holland has been to concentrate at Rotterdam, the great port near the mouth of the Rhine; but by being provided with the North Sea Canal for large ocean vessels, with a waterway 12 feet in depth connecting the city with the Rhine, and with numerous other canals for barges and small steamers, Amsterdam has been able to increase its trade slowly, but steadily, and to the unquestionable advantage of the industries and trade of Holland. The traffic passing the lock at Ymuiden in 1899 comprised 1,222 vessels, with a net tonnage of 4,029,356. In 1904 the figures for net tonnage were 4,662,229.

The Manchester Ship Canal carries ocean ships inland 35½ miles, and raises them by means of four locks to an elevation of 60 feet above sea level. This waterway, completed in 1894 at a cost of $75,000,000, terminates inland in an extensive system of docks, and Manchester has been made a seaport with a commodious harbor. The depth of the canal is being increased from 26 to 28 feet at low water. The minimum bottom width is 120 feet. The cost of the canal far exceeded the estimates, and the traffic has

not grown so fast as was expected; but in 1899, at the end of five years, 5,182 vessels, registering 1,395,702 tons, and carrying 2,778,108 tons of cargo, passed the locks. In 1904, at the end of ten years, the traffic comprised 3,917,-578 tons of freight. The gross receipts from all sources during 1904 were £418,043 ($2,035,869). This sum covered the operating expenses, and left £177,748 ($865,-632) to be applied toward the interest charges. The canal was constructed by a semipublic corporation, to which the City of Manchester loaned $25,000,000. The company is now so organized as to give representatives of the City of Manchester a majority in the board of directors.

By the canalization of the Clyde, the Thames, the Elbe, the Weser, the lower Rhine, the Scheldt, the Delaware and Columbia, and other rivers, and by opening channels across the bars obstructing the entrance to Liverpool, New York, New Orleans, Galveston, Portland, and many other important ports, a great expansion of commerce has been made possible, and the usefulness of the ocean as the world's trade highway has been largely enhanced. The improvement of the approaches to ports by constructing a canal, canalizing a river, or dredging a submerged channel, is, however, a part of the work of providing terminals adapted to the requirements of present-day commerce.

The modern port, or the terminal of an ocean route, usually comprises three distinct parts: the channel from the sea, the harbor proper, and the facilities for receiving and forwarding traffic. Some seaports—none, however, of the first rank—are provided by nature with channels and harbor basins of adequate depth and size; in most instances, the channel and harbor, as well as the facilities for handling traffic, are more or less artificial.

Ports are of four different types: the roadstead, the natural bay, the river port, and the combination of river and bay port. As examples of the roadstead type may be

mentioned Boulogne (France), Dover (England), and San Pedro (California). These cities are located on the ocean shore, where no natural embayment provides quiet water for anchorage. In the case of these, and other cities that might be mentioned, harbors are being created at Government expense, by the construction of costly breakwaters, and by the dredging of the basins thereby inclosed.

The Puget Sound ports, and San Francisco, Pensacola, and Boston, in the United States, Southampton in England, and many other cities similarly located, are examples of natural bay ports. In some cases, as, for instance, at Mobile, Ala., the bay on which the city is located has to be dredged to accommodate the deep-draft vessels now employed in ocean commerce. The city located on a bay of ample area, and of thirty feet and more in depth at low tide, can provide a terminal for handling ocean traffic at a relatively small expense; but the trade of a city so located will generally be less than that handled at a city located near the mouth of a large river, because the river affords connection with a large inland area of production and consumption. The river port usually has a better *Hinterland* than the bay port has.

London, Hamburg, Bremen, Rotterdam, Antwerp, Philadelphia, New Orleans, and Portland, are conspicuous examples of river ports, and this partial list shows that most of the great seaports are located on rivers. The cheapening of rail transportation, and the increasing efficiency of the railroad, are giving the roadstead and bay ports greater possibilities, by enabling them to compete with river ports over a wider traffic area; but the extensive improvements of inland waterways and the technical development of inland navigation are likewise building up the trade of the river ports. Hamburg and Rotterdam are the ports whose trade has increased most rapidly during recent years.

A city located as New York is, at the head of a bay and also on a large river, has the most favorable location possible. The maritime commerce of New York, coastwise and foreign, exceeds that of any other port of the world. The *Hinterland* of New York city extends west nearly to the Missouri River, and when the city is connected with the Great Lakes by a waterway that will accommodate barges carrying 1,000 tons of cargo, and is thereby given facilities for inland navigation comparable with those now possessed by Rotterdam and Hamburg, New York will be able to take far greater advantage, than is possible under present conditions, of the development of the vast inland tributary territory.

Classified according to the authority that improves and administers them, ports are public, semipublic, and private. While all seaports, whether the harbor facilities are constructed with public funds or private capital, are open to the use of the public under Government regulation, at some ports the channels and basins are improved by the city or State in which the port is situated, and the land fronting the harbor is owned by the city or State; again, at other ports the channel, harbor area, and dock properties are constructed, owned, and administered by a public "trust" or nonprofit corporation acting under authority granted by the State and municipality; and there also are ports that have been created by railroad and industrial companies to enable them to develop their traffic and business.

Bristol, England, affords a good instance of a public port. The municipality now owns and manages as a branch of the city government the entire port and its facilities. Preston, England, is another municipal port. Most of the larger ports of England, however, are in charge of public trusts. The public trust—e. g., the Mersey Docks and Harbor Board at Liverpool—derives its powers from

Parliament, and is composed of nonsalaried representatives of the municipality and of the various commercial organizations and interests centered at the port. The trust raises the capital required to improve and administer the port by levying various port and dock charges, and by borrowing money upon the security of its authorized charges.

A good example of a large private port in England is Southampton, where the London and Southwestern Railway has constructed extensive docks and provided all the various facilities required for passenger business, and for handling freight traffic of practically all kinds.

The central Government, or Parliament, has not aided in the construction of harbors, except to carry out certain works for naval purposes. The port of Dover, for instance, has recently been made a harbor that will accommodate large naval and merchant ships, and Parliament has borne a part of the expense.

On the Continent of Europe the public type of port prevails. In France the central Government is the authority; but in Germany the local Government creates the port and its facilities, some aid for dredging the channels being received from the State Government—not from the Empire.

The American system of harbor construction and administration is somewhat complicated. The harbor basin and channel from the sea are dredged and maintained by the National Government. The Federal authorities mark the line to which the piers and wharves may extend from the shore into the channel. From the pier line shoreward the State has jurisdiction; and the State may either exercise this jurisdiction directly, as is the case with Louisiana at New Orleans, and California and the State of Washington, or the State may vest the port administration with the municipal Government. The division of authority be-

tween State and municipal officers assumes various forms, each State having laws peculiar to itself.

The State system of harbor administration in the United States is well illustrated by California, where the State retains the ownership of the water frontage, and administers the ports through a Board of State Harbor Commissioners. The board can locate and construct wharves, erect all necessary improvements, and, together with the governor and mayor, may fix rates for dockage and wharfage.

At the port of New York, the Commissioner of Docks, appointed by the mayor, is the administrative officer. Most docks and wharves are owned by the city under a grant dating from colonial times; however, a part of the water front is claimed as private property, of which the city is endeavoring to secure possession. In 1890 a Board of United States Engineers established a bulkhead line around the island, and a masonry bulkhead is being constructed that will in time surround the island. As Mr. Byall states: "Wharf construction is now systematically planned and carried out under the Commissioner of Docks, appointed by the mayor. The wharves are leased for terms of years varying from ten years to those terminable at the pleasure of the commissioner, and at rentals of from $50 to $100,000 per year under one lease."

The port of Philadelphia is administered by a Board of Port Wardens, consisting of a master warden, appointed by the governor of the State, and sixteen assistant wardens selected by the City Councils. This board, since 1870, has constituted a part of the city government known as "the Department of Port Wardens," and is supported by appropriations from the city treasury. The Board of Port Wardens has control of the port of Philadelphia in accordance with State laws and city ordinances, and acts mainly through the Master Warden and the Harbor Mas-

ter. The water frontage, except at the ends of streets, is privately owned; and the wharves and piers, with the exception of a public one erected by the city at a street terminal, are built and owned by the owners of the frontage. The private piers are constructed according to plans and upon locations approved by the Board of Port Wardens, and the board has the power to require the owners of private piers to permit vessels not belonging to them to load or unload at the piers. The ownership of the pier is private; its use is both public and private.

There are many variations in the systems of port control prevailing in the United States, but the three cities referred to represent the chief types of ownership and administration. At San Francisco, the State owns the port property and administers it by a State board; in New York, the city owns or is acquiring the port facilities, and a city officer is in control; in Philadelphia, the piers and wharves are private property, and the Board of Port Wardens represents both the State and city governments.

The development of ocean transportation during the past century has required great technical improvements in the terminals of ocean routes. A hundred years ago, channels and basins ten to fifteen feet in depth could accommodate the vessels then in service; now, no port can handle a large ocean commerce without approaches and anchorage at least thirty feet in depth at low tide, and for ports of the first rank, like New York, forty feet has come to be necessary. The largest ocean ships are now constructed with reference to a maximum draft of thirty-two to thirty-five feet.

Formerly, vessels were loaded and unloaded by hand labor, and small warehouses served to store the cargo; now, each vesssel is equipped with steam windlasses, and there are steam and hydraulic cranes, powerful coal dumps, and other hoisting apparatus, stationary and floating ele-

vators, and many kinds of mechanical appliances located without the ship to hasten and lessen the work of handling cargo. In the largest and most modern ports the one-story warehouses of former days have been supplanted by two-, three-, and four-storied structures of steel or masonry. The warehouses are not only equipped with powerful elevators, but are so designed and operated that cargo may be handled directly between each story and the hold of the ship.

A great port like Hamburg affords a most striking illustration of the tendency of the age to economize labor by investing capital in machinery. The ocean port, including its channel, basins, docks, piers, elevators, and facilities for handling and warehousing cargo, requires enormous expenditures for construction, maintenance, and operation; but here, as elsewhere, the work of the world can be more fully and more economically done by substituting capital costs for labor expenses.

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# PART II

# THE OCEAN TRANSPORTATION SERVICE

## CHAPTER V

### THE OCEAN FREIGHT SERVICE

The business of ocean transportation, like that of rail carriage, comprises the freight, passenger, mail, and express services, and each branch of the service merits separate consideration.

The freight and passenger services on the ocean are mainly performed by different kinds of ships, and the two services are nearly distinct. The passenger traffic is now all handled by steamers, and the vessels are operated as "lines" whose ships have definite routes and a fixed schedule of sailings. Freight, however, is handled both by sailing vessels and by steamers, and both classes of ships may be run as lines having fixed sailings, or may be employed as chartered vessels hired to be dispatched to such places and at such times as the demands of shippers may determine. Accordingly, ocean freight is moved as "line" or schedule traffic, and as charter or nonschedule traffic. In this regard there is a general analogy between rail and ocean traffic. Most rail freight is forwarded at the convenience of the shipper, and by trains that have no fixed schedules; but there is also a growing volume of schedule freight—fruit, milk, dressed meat, etc.—handled by trains operated upon a definite schedule.

The differentiation of the freight and express services is not so sharp on the ocean as upon the railway. While express companies do an international business, and ship their parcels by the passenger steamers, the steamship com-

pany, as will be explained later, does not contract, as the railroad company does, to turn all express business over to some particular company. The ocean carrier operating fast steamers deals with express companies as with individual shippers; and it may not only carry packages for several express companies, but may and does solicit the high-class freight and package traffic from exporters, forwarders, and individuals.

The mail service performed by ocean steamers is analogous with that of the railroad company; in each instance the Government contracts with the carrier for a definite service of stipulated speed and frequency; but the compensation of the ocean carrier is not always based upon the weight of the mail matter handled, as is true in the railway mail service, the pay of the steamship company being sometimes the amount of the ocean postage in whole or in part, and sometimes a definite annual sum of money. In making contracts for carrying the mails, governments often provide for better facilities for freight and passenger traffic, and mail payments often accurately, but sometimes incorrectly, are spoken of as mail "subsidies."

The transportation of the ocean commerce of the United States is a service of great magnitude and of increasing volume. The total value of the foreign trade of the United States (imports and exports) for the year ending June 30, 1905, was $2,636,074,349. Some of this, but less than 5 per cent of the total, was carried by rail across our Northern and Southern borders; another small fraction was carried across the Great Lakes lying between our country and Canada; but fully nine tenths of our vast foreign commerce is maritime traffic. The coastwise traffic of our Atlantic, Gulf, and Pacific seaboards, while much less in volume and value than our foreign trade, constitutes an additional maritime transportation service of large tonnage, the exact amount of which, however, is not recorded.

There is, moreover, the trade and traffic between the United States and its "noncontiguous territories," which in 1904 amounted to nearly $100,000,000 in value. Finally, there is the foreign trade of these noncontiguous territories with countries other than the United States, which in 1904 exceeded $50,000,000.

To transport the foreign commerce of the United States in 1905, vessels with an aggregate tonnage of 31,000,000 tons net register entered and cleared our ports. What the entrances or clearances of our coastwise fleet were at the seaports of the United States cannot be stated; but the tonnage of our maritime coastwise fleet exceeds 3,000,000 tons, and the entrance or clearance figures would naturally be several times the enrolled tonnage. The commerce of the United States with its possessions, and the trade of those possessions with the world generally, call for an increasing shipping service.

The internal development of the United States is being accompanied by a rapid expansion of our international trade. This growth of international commerce has been made possible by cheaper and better transportation, both by rail and by water, whereby both heavy commodities of low value per weight, and also perishable articles, have become transportable. The growth of the world's tonnage during the past fifty years has been due mainly to the steady increase in transportation of mineral and forest products that must be carried cheaply, if at all, and secondarily to the constantly growing traffic in fruits, meats, and other commodities which require a fast freight service, refrigeration, and special warehousing facilities.

Freight traffic, by land and by sea, is thus changing in character as well as increasing in volume. Formerly only nonperishable articles of relatively high value could be successfully carried long distances; now the world's

commerce includes a vastly wider and an ever enlarging range of traffic. This same thought may be differently stated, by saying that the transportation service has become cheaper for all classes of traffic; faster for such articles as require rapid transit, more reliable with the substitution of steam for sails, and more specialized with reference to the service to be performed. As instances of specialization in the ocean freight service may be mentioned the fruit steamer, the tank steamer for carrying oil, and the ore vessels for carrying iron ore or coal.

The organization of the ocean transportation service may be discussed by considering (1) line and charter traffic, (2) the business arrangements whereby the movement of traffic is facilitated, and (3) the provisions for the transfer of traffic at the terminals.

1. Vessels are operated singly, or as members of a line. The ship operated as a single unit, either by its owners or by those that may lease (charter) the vessel, is properly called a tramp, because the ship moves from one route to another or from one port to another as its services may be desired. The larger share of the bulky ocean traffic is carried by the tramp steamers and sailing vessels chartered to make a particular voyage or to be used for a limited time. The man or company desiring to ship a vessel cargo of coal, or lumber, or locomotives, or raw cotton, or some such commodity, hires or charters a vessel to perform the service. The person of whom the vessel is chartered operates the ship and performs the service, charging therefore either a certain rate per ton of cargo or a certain amount per month per registered vessel ton. The means by which the shipper secures the vessel he wishes, and the manner in which the rates are determined, will be explained in a later chapter; attention is here called only to the kind of service rendered by the chartered vessel. The chartered vessel, or tramp, like the

freight car, takes freight when it is ready to be shipped, and is free to go wherever there may be a shipment to be made. The tramp ship is bound to no one route and to no fixed schedule of movements; it is the independent, competitive ocean-freight carrier.

Where there is a steady flow of traffic in large volume over a definite route, an economical and efficient performance of the service requires that several vessels shall be operated under one management as a line, and that a fixed schedule of arrivals and departures shall be maintained. The number of vessels in the line and the frequency of sailings will be determined by the volume of business. Whether the company shall have the same number of ships in commission at all times will depend upon the seasonal or periodical fluctuations in traffic. The company operating a freight line frequently owns vessels enough to handle only the business of the periods of lighter traffic, and charters such additional ships as may be needed from time to time. The heavy freight traffic of regular volume is best handled by the line; likewise, fast freight, the transportation of passengers, and the carriage of the mails, are services which must be performed upon schedule time by vessels operated as lines.

2. To secure passenger and freight traffic for line vessels, to obtain cargoes for vessels seeking charter traffic, and to provide shippers desiring to charter a vessel with the ship they need, and at the time and place the ship is wanted, there are passenger agencies, freight forwarders, and ship brokers; to facilitate the purchase and sale of the commodities exchanged in commerce, there are banking houses that buy and sell bills of exchange; and to minimize the financial risks of ocean transportation, there are companies to insure both cargoes and ships. Each of these agencies has its activities

carefully organized; and the organization of international trade is so detailed and complex, that it can be only briefly referred to in this volume.

The large passenger steamship companies have offices or agents in all large cities, and the advertisements in the newspapers and magazines keep the traveling public fully informed regarding the transportation facilities afforded. The companies operating freight lines do not advertise so generally, but they all have announcements in the technical shipping journals, and they have offices and solicitors where the traffic to be secured warrants the solicitation of business. Moreover, there are firms of freight forwarders through whom commodities may be shipped to all sections of the world, and through whom commodities from all foreign countries may be imported.

The freight forwarder takes all kinds of freight, not only from the seaport of ocean shipment, but also from any interior point, and delivers the goods to the foreign seaboard or inland city of destination. As an importer, also, his services cover the entire transportation. The arrangements between shippers and forwarders are various; the most frequent contract made covers a single shipment; but oftentimes manufacturers, and others that are exporting regularly, make contracts running a year or more with forwarders to handle a stipulated amount of cargo weekly or monthly at agreed rates. Some, but not all, forwarding firms operate vessels of their own over certain routes.

Frequently the freight forwarder is also a ship broker. The ship broker performs a service of great importance. As Prof. J. Russell Smith says:[1]

Several thousands of ships are scattered over the oceans of the commercial world, engaged in a traffic that is supplied by hundreds

[1] "Organization of Ocean Commerce," p. 11.

# THE COSMOPOLITAN SHIPPING COMPANY

## COSMOPOLITAN LINE

### PHILADELPHIA AND LEITH
### (DUNDEE, ABERDEEN, ETC.)

| | | |
|---|---|---|
| PETER WRIGHT & SONS, General Agents | PHILADELPHIA | NEW YORK |
| JOHN E. EARLE & CO., General Western Agents | CHICAGO | |
| HUDIG & PIETERS, European Agents | ROTTERDAM AND AMSTERDAM | |
| HENDERSON & McINTOSH, Agents | LEITH | |

**Received,** in apparent good order and condition by **The Cosmopolitan Shipping Company,** from ........................ to be transported by the Steamship ........................ to sail from the Port of **PHILADELPHIA,** and bound for **LEITH, SCOTLAND,** (or as near thereto as she can safely get), with liberty to call at any port or ports in or out of the customary route, or failing shipment by said steamer, in or upon a following steamer ........................

**SHIPPER'S MARKS:**

**SAID TO WEIGH** ........................ **LBS.**

being marked and numbered as per margin shippers weight (quality, quantity, gauge, contents, weight and value unknown), and to be delivered in like good order and condition at the port of **LEITH** ........................ unto ........................ or to his or their assigns, he or they paying freight, primage and charges in cash, immediately on discharge of the Goods, without any allowance of credit or discount, at the rate of ........................

**ATTENTION OF SHIPPERS IS CALLED TO THE ACT OF CONGRESS OF 1851**

Any person or persons shipping Oil of Vitriol, unslaked Lime, Inflammable Matches or Gunpowder, in a ship or vessel taking cargo for Divers persons on freight, without delivering AT THE TIME OF SHIPMENT a note in writing expressing the nature and character of such merchandise, to the Master, Mate or Officer, or person in charge of the loading of the ship or vessel, shall forfeit to the United States "ONE THOUSAND DOLLARS."

........ *Bushels at* ........ *per* ........ *lbs.,* ........

........ *Ft.* .... *in. at* ........ *per cu. ft.* ........

........ *at* ........ *per* ........ *lbs.,* ........

........ *at* ........ *per* ........

*5 per cent. Primage,* ........

*Charges,* ........

*Total,* ........

IT IS MUTUALLY AGREED that the Steamer shall have liberty to sail with or without pilots; that the carrier shall have liberty to convey goods in craft and/or lighters to and from the steamer at the risk of the owners of the goods; and, in case the steamer shall put into a port of refuge, or be prevented from any cause from proceeding in the ordinary course of her voyage, to trans-ship the goods to their destination by any other steamer; that the Carrier shall not be liable for loss or damage occasioned by perils of the sea, or other waters, by fire from any cause or wheresoever occurring; by barratry of the master or crew; by enemies, pirates or robbers; by arrest and restraint of princes, rulers or people, riots, strikes or stoppage of labor; by explosion, bursting of boilers, breakage of shafts, or any latent defect in hull, machinery or appurtenances, or unseaworthiness of the steamer, whether existing at time of shipment, or at the beginning of the voyage, provided the owners have exercised due diligence to make the steamer seaworthy; by heating, frost, decay, putrefaction, rust, sweat, change of character, drainage, leakage, breakage, vermin, or by explosion of any of the goods, whether shipped with or without disclosure of their nature, or any loss or damage arising from the nature of the goods or the insufficiency of packages; nor for land damage; nor for the obliteration, errors, insufficiency or absence of marks, numbers, address or description; nor for risk of craft, hulk or trans-shipment; nor for any loss or damage caused by the prolongation of the voyage, and that the carrier shall not be concluded as to correctness of statements herein of quality, quantity, gauge, contents, weight and value. General Average payable according to York—Antwerp Rules. If the owner of the steamer shall have exercised due diligence to make said steamer in all respects seaworthy and properly manned, equipped and supplied, it is hereby agreed that in case of danger, damage or disaster resulting from fault or negligence of the master or crew in the navigation or management of the steamer, or from latent or other defects or unseaworthiness of the steamer, whether existing at time of shipment, or at the beginning of the voyage, but not discoverable by due diligence, the consignees or owners of the cargo shall not be exempted from liability for contribution in General Average, but, with the shipowner, shall contribute in General Average as if such danger, damage or disaster had not resulted from such fault, negligence, latent or other defects or unseaworthiness.

***IT IS ALSO MUTUALLY AGREED, that this shipment is subject to all the terms and provisions of, and all the exemptions from liability contained in the Act of Congress of the United States, approved on the 13th day of February, 1893, and entitled "An Act relating to the Navigation of Vessels, etc."***

1.—IT IS ALSO MUTUALLY AGREED that the value of each package receipted for as above does not exceed the sum of one hundred dollars unless otherwise stated herein, on which basis the rate of freight is adjusted.

2.—ALSO, that the Carrier shall not be liable for articles specified in Section 4281 of the Revised Statutes of the United States, unless written notice of the true character and value thereof is given at the time of lading and entered in the bill of lading.

3.—ALSO, that Shippers shall be liable for any loss or damage to Steamer or Cargo caused by inflammable, explosive or dangerous goods, shipped without full disclosure of their nature, whether such Shipper be Principal or Agent; and such Goods may be thrown overboard or destroyed at any time without compensation.

4.—ALSO, that the Carrier shall have a lien on the goods for all freights, primages and charges, and also for all fines or damages which the Steamer or Cargo may incur or suffer by reason of the incorrect or insufficient marking, numbering or addressing of packages or description of their contents.

5.—ALSO, that in case the Steamer shall be prevented from reaching her destination by Quarantine, the Carrier may discharge the goods into any Depot or Lazaretto, and such discharge shall be deemed a final delivery under this contract, and all the expenses thereby incurred on the goods shall be a lien thereon.

6.—ALSO, that the Steamer may commence discharging immediately on arrival and discharge continuously, any custom of the port to the contrary notwithstanding, the Collector of the port being hereby authorized to grant a general order for discharge immediately on arrival, and if the goods be not taken from the Steamer by the Consignee directly they come to hand in discharging the Steamer the Master or Steamer's Agent to be at liberty to enter and land the goods, or put them into craft or store at the owner's risk and expense, when the goods shall be deemed delivered and Steamer's responsibility ended, but the Steamer and carrier to have a lien on such goods, until the payment of all costs and charges so incurred.

7.—ALSO, that if on a sale of the goods at destination, for freight and charges, the proceeds fail to cover said freight and charges, the Carrier shall be entitled to recover the difference from the shipper.

8. ALSO, that full freight is payable on damaged or unsound goods; but no freight is due on any increase in bulk or weight caused by the absorption of water during the voyage.

9. ALSO, that in the event of claims for short delivery when the Steamer reaches her destination, the price shall be the market price at the port of destination on the day of the Steamer's entry at the Custom House, less all charges saved.

10.—ALSO, that merchandise on wharf awaiting shipment or delivery be at shipper's risk of loss or damage not happening through the fault or negligence of the Owner, Master, Agent or Manager of the Steamer, any custom of the port to the contrary notwithstanding.

11. ALSO, that this bill of lading, duly endorsed, be given up to the Steamer's Consignee in exchange for delivery order.

12.—ALSO, that freight prepaid, will not be returned, goods lost or not lost.

13. ALSO, that parcels for different consignees collected or made up in single packages addressed to one consignee, pay full freight on each parcel.

Cargo may be discharged into transit sheds or otherwise, immediately after the arrival of the ship, tonnage and shed dues payable by the Consignee of goods. The goods to be taken from alongside by the Consignee, immediately the vessel is ready, and as fast as she can continuously discharge; or otherwise they may be landed, weighed, put into crafts or warehoused at his risk and expense; the Steamer having a lien on the goods for all the expense so incurred. Should the Steamer be unable to enter the dock through bad tides, Consignees to provide crafts and take delivery in the river. The Collector of the port is hereby authorized to grant a general order for discharge, immediately after the entry of the ship. The lading and delivery of the cargo to be done by the Consignees of the ship, and the expense thereof to be paid by the Receivers of cargo. In order to facilitate the discharge, the Consignees of the vessel to have power to do the quay porterage to carts, trucks or sheds, charging the usual rate of the port. Where goods are weighed or measured on delivery to ascertain freight or for Customs' purposes, the charges for weighing, etc., to be paid by the Consignee.

***All risk of Fire or Flood while Goods are on the Dock, while awaiting shipment, to be borne by Shippers.***

AND FINALLY, in accepting this Bill of Lading, the Shipper, Owner and Consignee of the goods, and the Holder of the Bill of Lading agree to be bound by all of its stipulations, exceptions and conditions, whether written or printed, as fully as if they were all signed by such Shipper, Owner, Consignee or Holder.

IN WITNESS WHEREOF, the Master or Agent of the said Steamship hath affirmed to Bills of Lading, besides Captains' copy, all of this tenor and date, one of which being accomplished, the others to stand void.

Dated in PHILADELPHIA, 190

THE COSMOPOLITAN SHIPPING COMPANY,
PETER WRIGHT & SONS,
GENERAL AGENTS.

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of ports in all climes and all continents, from Greenland to New Zealand. Every day scores, or even hundreds, of these independent vessels are seeking freight to carry. It is a complicated world puzzle to bring together the ships and the freight so that the one may be most profitably employed and the other most economically carried. The work is done by the ship brokers and steamship agents, who receive their pay in the form of a commission or brokerage, a percentage on the transaction. In all shipowning countries these firms have their headquarters, and each one has agents and "correspondents" in many other countries, so that among them all they make a complicated web that reaches to all cities of commercial importance. The whole is so bound together by telegraph and cable that, like a spider's web, if touched by anything of importance at any point the whole structure vibrates with the news. The departure of a steamer loaded with sugar from a small port in Java, or ore from Chile, is reported by telegraph in Europe and America. There is practically a complete record of all vessel movements published daily by Lloyds, the Great British firm of underwriters. The men engaged in world commerce have, through their world telegraph, a world community of information.

In handling and accounting for ocean traffic, and in meeting the requirements of the shipping and revenue laws, several business papers are regularly made out by the shipper and the carrier. Upon delivering his goods to the ocean carrier, the shipper receives a *receipt* for each dray load or boat load of goods. The receipts are later exchanged for a *bill of lading,* stating the names of the consignor and the consignee, describing the goods, giving their weight or tonnage, their destination, and the rate of freight. An original and two or three manifold copies of the bill of lading are made, one being retained by the shipper as his receipt, one being kept by the captain of the vessel, and one is sent to the consignee. The bill of lading is negotiable.

When a shipment is from an interior city to a foreign country, it may be dispatched on a through bill of lading covering the rail and water carriage. The rail-

THIS RECEIPT MUST BE RETURNED IMMEDIATELY TO THE OFFICE AND EXCHANGED FOR BILL OF LADING.

**THE COSMOPOLITAN SHIPPING COMPANY,**

COSMOPOLITAN LINE.

For Bills of Lading Apply at Office, 305 and 307 Walnut Street. PETER WRIGHT & SONS, General Agents.

*Per Steamer* ........................ *Philadelphia,* ........................ *190* ........

*Received,* in apparent good order, for shipment by THE COSMOPOLITAN SHIPPING COMPANY,

*of* ..................................................................................

THE FOLLOWING PACKAGES TO BE FORWARDED SUBJECT TO THE CONDITIONS IN THE BILLS OF LADING.

CONDITIONS.—Notice of the terms of the Bill of Lading is hereby admitted, and this Property is received subject to all the provisions therein contained.

It is hereby stipulated and agreed that in case the whole or any part of the goods specified herein is prevented by any cause, from going in the steamship for which they are received, the Agents are only bound to forward them by succeeding Steamships of this Line, or by any other Line or Steamers due notice of which is to be given to shipper.

Merchandise on wharf awaiting shipment is at shipper's risk of loss or damage by fire and / or flood.

**This receipt MUST BE EXCHANGED for the usual Bill of Lading of the Line before the sailing of the Steamer by which the Goods are to be shipped.**

FULL NAME OF CONSIGNEE MUST BE GIVEN ON THIS RECEIPT.

MARKED:

*Gross Weight,* .................... *lbs.*

*Value of Shipment,* - - $ ........

*Receiving Clerk.*

DUPLICATE FOR WHARF.

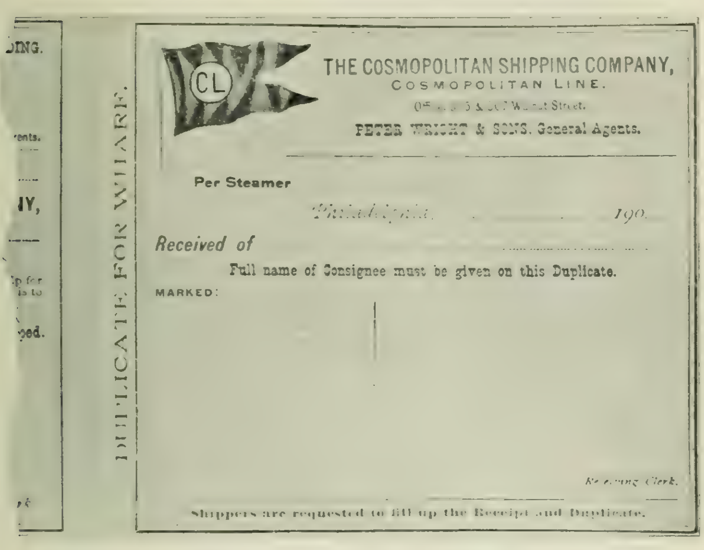
*Rec*

MAR

RECEIPT FOR FREIGHT FOR OCEAN SHIPMENT.

road company accepting the shipment collects the freight charges through to the foreign destination, and after deducting the rail charges, turns over the remainder of the amount collected to the ocean carrier or the forwarding agent responsible for the delivery of the goods to the foreign consignee.

The exporter must prepare an *invoice* of the goods he


DUPLICATE FOR WHARF.

THE COSMOPOLITAN SHIPPING COMPANY,
COSMOPOLITAN LINE.
PETER WRIGHT & SONS. General Agents.

Per Steamer

*Philadelphia,* *190.*

*Received of*

Full name of Consignee must be given on this Duplicate.

MARKED:

*Receiving Clerk.*

Shippers are requested to fill up the Receipt and Duplicate.

DUPLICATE FOR WHARF OF RECEIPT FOR OCEAN SHIPMENT.

is shipping, describing the several articles of freight, giving the prices paid by the purchaser of the commodities, and stating to whom the goods are consigned. The correctness of this invoice must be certified to by the resident consul from the country to which the freight is being shipped. The consular invoice is sent with the bill of lading to the foreign consignee, who is required to present the bill of lading and the certified invoice to the cus-

*INVOICE OF* *16,000 Bus. 2 Red W. Wheat*

**SHIPPED BY GRAFTON & CO., PHILADELPHIA, U. S. A.**

**GRAIN**

**Receivers, Shippers and Exporters**

**The Bourse**

*Shipped per S/S* *Laurentian* *for* *Glasgow*

*For Account and risk of* *New York*

*Freight* *2½d. per 60 lbs. & 5%* *Insured* *Ins. Co. of North America*

*Sale* *October 9th, 1905* *Contract No.*

| | | |
|---|---|---|
| *16,000 Bus. @ 90c.* | *$14,400* | *00* |
| *Freight £166.13.4* | | |
| *5% 8. 6.8* | | |
| *£175. 0.0 @ 4.83* | *845* | *25* |
| | *$13,554* | *75* |

Documents with Drafts:
- Bills Lading *2* Setts *8,000* Bus. dated *10/25*
- Insurance *2* " *$69.80* Ctfs. Nos. *136630-31*
- Ctfs. Weights & Inspection *2* "

E. & O. E.

Philadelphia, *October 25th, 1905*

Invoice of an Ocean Shipment.

toms officers in order to secure possession of the goods. The invoice is for the information of the Government, its main purpose being to aid in valuing imports and levying tariff duties.

The ship's *manifest* is another important paper. The manifest contains "the name or names of the places where the goods on board have been laden, and the place or places to which they are respectively destined; . . . a particular account and description of all the packages on board, with the marks and numbers thereon, the goods contained in such packages, the names of the respective shippers and consignees, as far as such particulars are known to the master" of the ship. The manifest also states the name of the vessel and its master, and its home port.[1] Before a vessel can clear from an American to a foreign port, a copy of the manifest must be filed with the collector of the port; and upon entering an American port the manifest must be filed with the same official; however, coasting vessels plying between ports situated within the same customs district of the United States need not file a manifest, although in clearing for or entering from a port of another district the manifest must be submitted. The seaboard of the United States is divided into four large districts. The coast from Maine to Florida constitutes one district, the Gulf coast west of Florida a second district, the Florida coast a third, and the Pacific seaboard a fourth.

The papers used in the ocean freight service, and the requirements which a vessel must fulfill upon clearing or entering a port, are concisely described in the following statement prepared by Peter Wright and Sons, Philadelphia:

"The carrier issues bills of lading in duplicate, tripli-

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[1] L. De Colonge. "The American Encyclopædia of Commerce."

THE ATLANTIC SHIPPING COMPANY.

ATLANTIC LINE. { New York—Liverpool
New York—Havre
New York—Cherbourg }

PETER JAMES & SONS, GENERAL AGENTS.
NEW YORK-PHILADELPHIA.

**Manifest** *of part of Cargo shipped by* ***THE ATLANTIC SHIPPING CO., Peter James & Sons, General Agents,*** *on board the ________ whereof ________ is master, for ________ ________ 190*

| MARKS | NUMBERS | PACKAGES AND CONTENTS | QUANTITIES Lbs., Gallons, etc. | No. 1 Value of DOMESTIC Merchandise | No. 2 Value of Foreign Merchandise FREE | No. 3 Value of Foreign Merchandise FROM BONDED WAREHOUSE | No. 4 Value of Foreign Merchandise not FROM BONDED WAREHOUSE which has paid duties | No. 5 Value of Foreign Merchandise on THE PASSAGE (IN TRANSITU) from one foreign country to another | TO BE LANDED AT |
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MANIFEST OF AN OCEAN SHIPMENT.

cate, or quadruplicate, as shippers may require for each shipment of merchandise taken on board; such bills of lading are a receipt given by the vessel for the goods accepted, and contain a promise to deliver the goods at the port of destination, 'in like good order and condition,' with, of course, the usual exceptions, such as dangers of the seas, etc. The shippers are then required to have executed, before the resident consul for the country to which the goods are destined, a consular invoice certifying to the shipment, its value, etc. The bill of lading, together with the consular invoice, are then forwarded to the consignee in the foreign country, either direct or through a bank, depending on the conditions of sale; the production by the consignee in the foreign country of such bill of lading, with consular invoice, certifies to the foreign customs authorities in regard to the ownership of the merchandise, and enables the owner to secure proper delivery of his property.

"A steamer, on clearing from a United States port, must present at the customs house a full and complete manifest, giving a full and complete list of each shipment, marks and numbers, if any, value of the merchandise, and destination. This manifest is certified to by the customs officials, and returned to the master together with a '*clearance*.' The clearance paper is a document certifying that the steamer has complied with necessary Government formalities, stating the number of men in the crew, and also stating that the ship is authorized to sail for the port named.

"The United States customs officers also issue a *bill of health*, certifying to the general state of health of the port.

"Having obtained its clearance papers, the master of the vessel must then report to the consul of the country under whose flag the ship sails, and state his intention of

Art. 135, Customs Regs., 1899
Sec. 4201, Rev. Stats.
(Ed. 12-16-04—15,000)

Cat. No. 1378

DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF NAVIGATION

# The United States of America.

# CLEARANCE OF VESSEL TO A FOREIGN PORT.

*District of* ______________________

*Port of* ______________________

**These are to certify all whom it doth concern:**

*That* ______________________

*Master or Commander of the* ______________________

*burden* ______ *Tons, or thereabouts, mounted with* ______

*Guns, navigated with* ______________ *Men,* ______________

______________ *built, and bound for* ______________________

______________________________________________

*having on board* ______________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

*hath here entered and cleared his said vessel, according to law.*

**Given** *under our hands and seals, at the Custom House of* ______

______________, *this* ______________ *day of* ______________

*one thousand nine hundred* ______________, *and in the* ______________

*year of the Independence of the United States of America.*

______________________ ______________________

*Deputy Naval Officer.* *Deputy Collector.*

CLEARANCE OF A VESSEL TO A FOREIGN PORT.

sailing for the designated foreign port. The consul then returns to the master of the vessel the *articles and register* that had been deposited at the consulate immediately on a vessel's arrival in port. The *articles* is a document containing the names of all the members of the crew, with notation of the position each man fills; the *register* is a document issued by the government under whose flag the vessel sails, describing the vessel, her dimensions, capacities, tonnages, etc.

"Before sailing, the master of the vessel must also apply to the consul of the country in which the port of destination is located, and secure his *visé* of the manifest, clearance, and other documents issued by the United States customs authorities. The consul generally issues a certificate as to the accuracy of the documents, and also issues a bill of health, certifying to the health conditions of the port of departure.

"In connection with the foregoing matter of reporting a sailing to the resident consul of the country wherein is located the port of destination, it is a noticeable fact that the more progressive countries, such as England, Germany, France, Holland, Japan, Italy, Norway, Sweden, etc., require very little formality, while the countries which comprise the 'Latin race,' more particularly Spanish and Portuguese, and countries under such influence, particularly the South American countries, require an extraordinary amount of detail, frequently even more than is enumerated in the foregoing; furthermore, such documents are generally required to be executed in the language of the foreign country, and all of them heavily laden with consular indorsements, official seals, etc., and we are told that any slight irregularity in such documents on presentation at the foreign port of discharge is punishable by heavy fines. Very few, and in some instances none, of these extravagant formalities are required at

Cat. No. 1380
Art. 132, Customs Regulations of 1899
COMMERCE AND LABOR CIRCULAR NO. 1

DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF NAVIGATION

# THE UNITED STATES OF AMERICA.

## BILL OF HEALTH.

*Custom House, Port of* ____________

**To all to whom these Presents shall come:**

**Whereas,** *the* ________________________________

*of* ____________, *of which* ________________________

*is Master, is now ready to depart from the Port of* ____________ *for* ________________, *and other places beyond the sea, with* ________________ *persons, including the Master of the said vessel:*

**We, therefore,** *by these presents, do make known and Certify that no plague, nor any other dangerous or contagious disease in an epidemic form, at present exists in the said Port.*

*GIVEN under our hands and seals of office, this* ______ *day of* ________________, *190*__.

________________________

*Collector of Customs.*

________________________

*Naval Officer.*

BILL OF HEALTH.

the consulates of the more progressive countries above enumerated, the principal requirement being a bill of health, the United States customs documents sufficing at the discharging port."

In the purchase and sale of commodities exchanged in international trade, *bills of exchange* are used to facilitate the settlement of accounts. The bill of exchange, however, is not a transportation paper, but a financial one, "directing one party to pay a sum of money to another—either the person who gives the order, or some third person—at some day fixed or ascertainable." [1] The form and functions of bills of exchange may be studied at length in books dealing with the law and practice of commerce, and need only be referred to here in passing.

3. The ocean transportation service begins and ends with the handling of the freight at the seaboard terminals. The transfer of cargo, particularly of bulk freight like grain, coal, lumber, and bananas, is frequently made wholly or in part directly from car to ship or ship to car; but usually it is more economical to load and unload the vessel more rapidly than this direct transfer will permit, and the cargoes are stored for a time on piers or in warehouses. In the case of mixed cargoes of general merchandise storage is usually necessary both for the inbound and outbound freight.

The tendency is to provide as far as possible for the mechanical handling of cargoes, to accomplish the threefold purpose of reducing labor costs, reducing the time of detention of the ship in port, and economizing in storage by getting goods out of the warehouses as quickly as possible. The mechanical appliances for transferring freight consist of hoisting engines aboard the ship, and of cranes and derricks on the piers and wharves.

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[1] L. De Colonge. Ibid.

In discussing the handling of freight,[1] Professor Smith divides freight-handling machinery into two classes: (1) machinery for handling general miscellaneous cargo, and (2) special types of machinery for particular kinds of heavy articles moved in bulk cargoes or large quantities. The first of these two types of transferring machinery includes both ship and pier apparatus —the winches or donkey engines on shipboard, and the derricks and cranes on the wharf or pier. The ship's machinery is useful in getting general cargo into and out of all parts of the hold of the ship, and is used to advantage in loading and discharging cargo, when the transfer is only from barge or quay to the ship, or from the vessel to the barges or quay. For raising and lowering heavy articles, and for transferring packages to and from points beyond the reach of the ship's derricks, a derrick or moving crane operating upon the land is necessary. In many European ports the quays are equipped with capstans, cranes, and derricks operated with power, usually hydraulic, supplied from a central plant. This centralized organization of the facilities for handling general cargo has not been carried out extensively in the United States, where for the most part each large carrier equips and operates his own piers and wharves.

For handling grain, coal, ores, and similar commodities that are shipped in large bulk, special types of machinery have been provided at most large ports, those in the United States being somewhat ahead of those in other countries. From the time the wheat is delivered by the farmers at the small local elevator until it is converted into flour in the large milling centers of the United States or of Europe the grain is handled entirely by machinery; cars and vessels being loaded and unloaded, elevators

[1] "Organization of Ocean Commerce," Chapter XIV.

filled and emptied, by mechanical appliances. There are two methods of loading wheat into the ocean vessel: one being to bring the ship alongside an elevator and chute the grain into the ship by gravity; another being to take the grain from cars, or elevator, to the vessel in floating elevators. The latter method is the one followed in New York, and has the advantage of allowing the vessel to lie alongside its own pier and take on general cargo, while grain is being placed into the hold by a floating elevator on the side of the vessel opposite the pier.

There are three general methods of handling coal or ore. When possible, the coal and ore are brought by cars to the Great Lakes, or the seaboard, and are dumped through the bottom of the cars into the "pockets" of a high pier, and are run from the pockets into the vessel by gravity. Another method much employed in loading coal into vessels is to elevate the car and its load and dump the coal into chutes leading to the bunkers or hold of the vessel. Electric cranes carrying bucket loads of five tons, more or less, are much used to unload ore and coal at the lake and ocean ports. The buckets are often carried to and from the vessels under steel cantalevers several hundred feet long. This enables coal and ore to be stored in dumps or loaded into cars some distance from the ship.

Among the highly useful port facilities are the numerous specialized warehouses for grain, fruit, meat, tobacco, and various other commodities. In the great European ports these various warehouses are supplied and managed by the port authorities, and regular charges for the services are collected. This policy has been a great aid to the development of trade. In the United States the warehousing service is usually performed by the shipper or carrier. The European system enables the small ship-

per and carrier to engage in business more easily than he can in the United States.

As far as possible the railroad and the vessels are brought side by side, and cargo is transferred mechanically from one carrier to the other. In practice, however, a large amount of storing and warehousing is necessary, and also a large amount of lightering, trucking, and carting of goods is unavoidable. In the London docks three fourths of the cargo of the vessels is loaded and unloaded from lighters. In New York harbor there are ten thousand lighters. The lighters carry the cargoes from one part of the port to another, from the shipper to the ship, or the reverse, or from one ship or warehouse to another vessel or quay. A surprisingly large amount of this transfer work is done by drays and wagons, for which special loading and unloading machinery is often provided. The dray, however, is used most largely for handling freight between the quays and the warehouses, stores, and factories of the merchants and manufacturers doing business in and near the seaports.

## REFERENCES FOR FURTHER READING

Smith, J. R. "The Organization of Ocean Commerce." 1905. Chapters II, III, and XIV.

"The Foreign Commerce and Navigation of the United States." Bureau of Statistics, Department of Commerce and Labor. (These annual volumes contain the statistics of our foreign trade, and give a yearly review of the foreign commerce of the United States.)

# CHAPTER VI

## THE PASSENGER SERVICE

The ocean passenger service receives more attention and current discussion than the freight service does, not only because everyone is more concerned about the personal comfort and safety of himself and his friends than he is about the conditions affecting the transportation of his property, but also because the passenger service is conducted in vessels whose speed and equipment are much advertised by the many steamship companies. Ocean travel, moreover, is a favored theme with the popular magazines and their contributors. For these reasons the main facts regarding the ocean passenger service are rather widely known, and an extended statement will not be necessary in this treatise. The forces controlling ocean passenger fares will be discussed in a later chapter.

Though the ocean passenger service is of less importance than the freight traffic in the economy of society, the service of carrying passengers and the mails has had a greater influence than the freight business has exerted upon marine engineering and upon the introduction of technical improvements in ships. The great *desideratum* in the freight service is economy and safety; in the transportation of passengers, speed and safety; and as between economy and speed, it is to the latter that inventors have given greater study.

Invention has accomplished great results in increasing the speed of ocean steamers, and in enhancing the com-

forts and safety of ocean travel. During the past fifty years the time of passage across the North Atlantic has been reduced one half, and nearly as great a reduction has been made on the other important ocean routes. The comforts and conveniences now obtainable aboard the best steamers are incomparably superior to those provided a generation ago. Ocean travel still has its risks; but the ship 500 to 700 feet in length and 65 to 75 feet in breadth, with twin screws, numerous water-tight bulkheads, and a double steel bottom, has greatly reduced the dangers of the sea voyage. Every year sees some new feature added to the equipment of the oçean liner, despite the fact that electricity, elevators, ice machines, cold storage, and numerous other auxiliaries have already made the ocean vessel a great floating hotel. The future will doubtless greatly improve upon present facilities; indeed, the turbine engine, the introduction of which is just beginning, promises not only to increase appreciably the speed of ocean vessels, but also to reduce the unpleasant jarring motion of the ship caused by the powerful reciprocating engines now employed to secure high speed.

The technical development of the ocean passenger service has been the cause and consequence of the rapid increase in the volume of ocean travel. Since 1880, the annual number of Americans taking cabin passage abroad has more than trebled, and the number of immigrants entering the United States each year has more than doubled. In 1904, the cabin passengers departing from the seaports of the United States numbered 184,613; the number of "passengers other than cabin" was 323,591, making a total of 508,204. The arriving cabin passengers numbered 175,818, and the immigrants 812,870, making a total of 988,688 arrivals. In 1905 the tide of immigration rose even higher, and over a million steerage passengers—1,026,499—were admitted. The total num-

THE *Amerika* OF THE HAMBURG-AMERICAN LINE.

The largest ship afloat in 1906. Length, 687 feet; beam, 74½ feet; depth, 53 feet; gross register, 22,000 tons; displacement 42,000 tons.

ber of inbound passengers in 1905 was 1,194,648. The number of passengers departing from the United States that year was 536,151, making the total passenger traffic of 1905, 1,730,799.

The third-class or steerage passengers far outnumber those who travel in the first and second cabins. The steerage business is also more profitable to the steamship company. The steerage passenger pays a low rate of about one third the average fare charged the first and second class, but his accommodations occupy little space, and the company spends relatively little on his table and his stateroom. The large passenger steamer can readily carry four or five steerage passengers for each person in the cabins, and the steerage expenses will be much less than the cabin expenses. The steerage traffic is so profitable that the steamship lines between Europe and the United States compete keenly for this business, and the low fares and comparatively comfortable accommodations given the third class induce great numbers of poor people to migrate, that would prefer to remain in their native land if the dangers and discomforts of travel were greater. The service of transporting emigrants from the interior of Europe to America and elsewhere is highly organized by the steamship companies and by other agencies, and the ease and cheapness of the steerage passage, as well as the allurements of life in a new country, steadily swell the volume of ocean travel.

The number of persons taking trips abroad is greatly increased by the numerous tourist agencies. The agencies relieve the traveler of the business details of travel, secure him hotel accommodations, furnish him with international banking facilities, and supply him with couriers, guides, and interpreters in all countries. The educational value of foreign travel is enhanced by "bureaus" that direct the preparatory reading of tourists and supply them *en route*

with educated conductors who lecture on the art and history of the countries and cities visited. Formerly people traveled abroad from love of adventure, or because of imperative business reasons; now, the chief motives of the ocean cabin passenger are recreation and education. With the increase in the number of people having leisure and a surplus income, with the spread of education among all classes of society, with the ever-growing ease of ocean travel, the greater will be the number of persons that seek

IMMIGRANT STATION, ELLIS ISLAND, NEW YORK HARBOR.

to satisfy the travel longing—the *Reiselust*—that possesses in greater or less measure the soul of every man.

For handling passenger traffic at the ports, separate arrangements are necessarily provided for cabin and steerage passengers. For sanitary and other reasons, the Government inspects steerage passengers more rigidly than those who take cabin passage, the laws regarding immigrants into the United States being particularly comprehensive and exacting. On arriving at New York, a passenger steamer stops first in the lower bay and is boarded by the State health officers. If the report of the ship's physician regarding the passengers is satisfactory, and if the inspection of the crew reveals no contagious or infec-

tious disease, the ship proceeds to its company's pier and discharges its cabin passengers and the mails, if it is a mail steamer, after which the vessel proceeds to the immigrant station on Ellis Island, where all steerage passengers must land. Each immigrant is there inspected by officers of the United States Bureau of Immigration. If the immigrant meets all the requirements of the law as regards health and ability to support himself, and is not a criminal, an anarchist, or a laborer imported under contract, he is allowed to land and proceed to his destination. If the immigrant is denied entry into the United States the steamship company that brought him to our shores must return him without cost to the port from which he sailed.

The ocean passenger traffic through the port of New York exceeds that of any other port of the world; but the arrangements provided for cabin passengers are not so convenient as those to be found in numerous other ports, such as Southampton, England, where one may pass directly from steamer to train, and from train to steamer; or such as Liverpool, where all passenger steamers ship and discharge their passengers at a common " landing stage " centrally located.

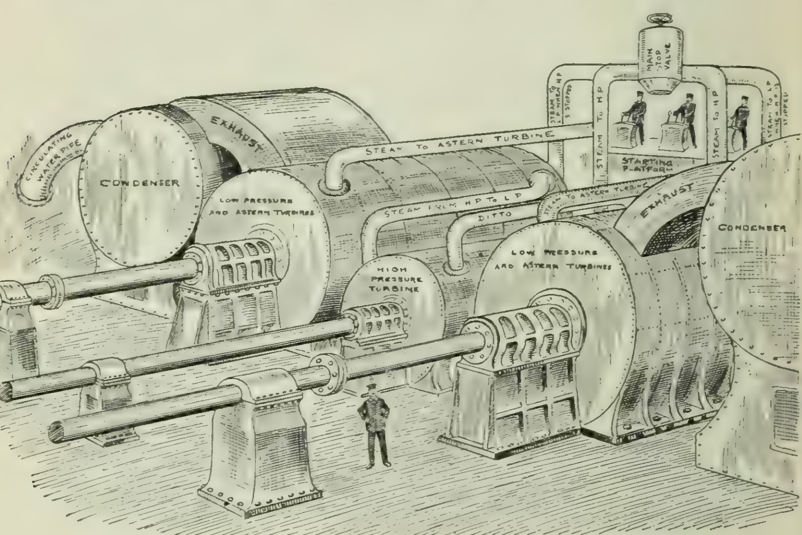
Certain marked tendencies are noticeable in the development of the ocean passenger service. It has been the custom of all ocean lines to divide passengers into three well-defined classes. In this regard the ocean passenger business has followed the practice of the European railway passenger service rather than the service on American railroads. Although classification is carried out to some extent in railroad passenger traffic in the United States, travelers do not divide themselves into such distinct classes as they do in Europe. In the United States the great majority of people travel by what is called first class, which in reality corresponds with the second class in Europe, where most people patronize the third class, which cor-

THE *Carmania.*

A turbine steamship of 20,000 tons gross register.

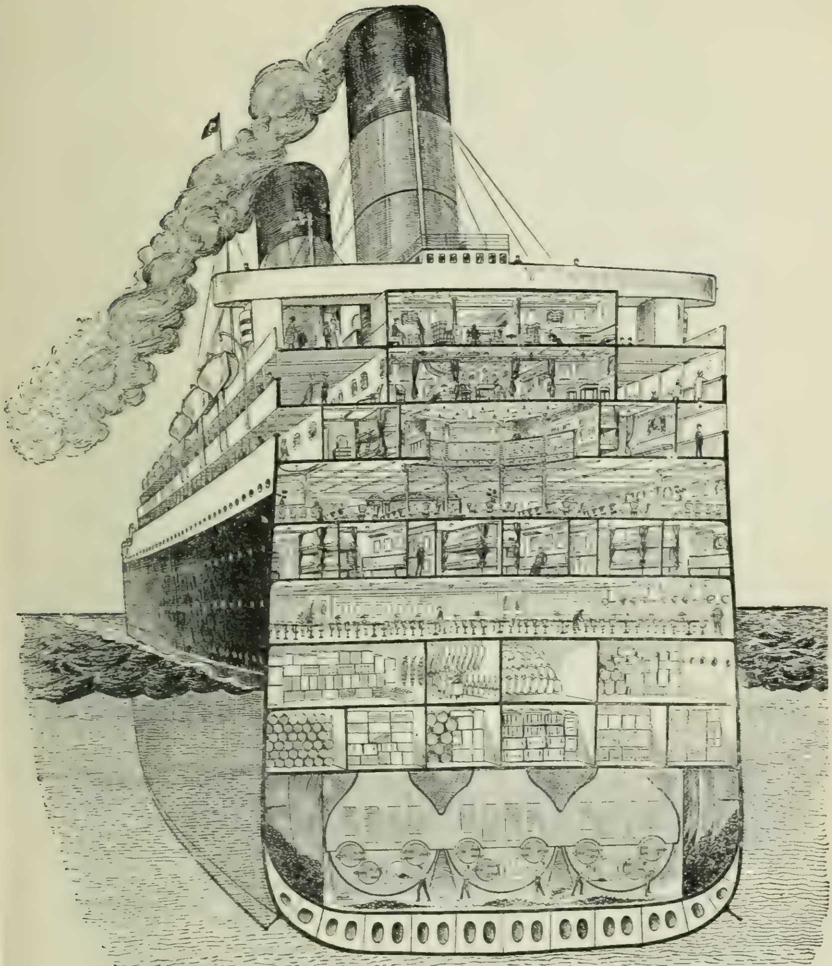
responds to the second class in the United States—a class that is used so infrequently that many people in our country are ignorant of its existence.

The ordinary ocean liner carries many more first-class than second-cabin passengers, and usually has more persons in the third class or steerage than in either of the cabins. The number of steerage passengers is largest on the North Atlantic and on the west-bound trip across the Atlantic.




THE TURBINE ENGINES OF THE *Carmania*.

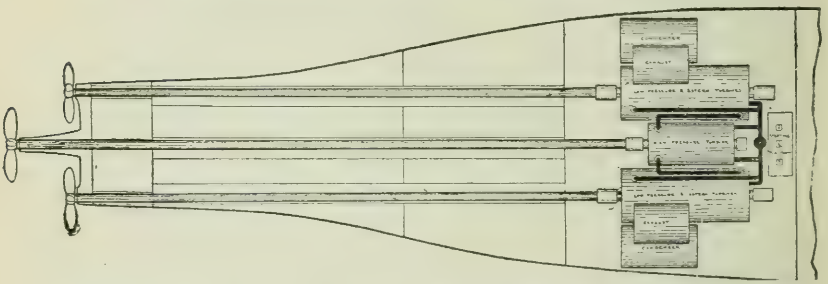
Until recent years steamship companies have given most attention to improving the accommodations afforded the first-class passengers, and but little attention has been given to making the second and third classes attractive and comfortable. During the past few years, however, particularly at the present time, some of the large steamship companies on the North Atlantic are doing as much to improve the second and third classes as they are the first class. The



Cross-section of the *Carmania*.

largest profits now come from the traffic below second class, and the steamship companies have discovered that the volume of low-class traffic may be largely increased.

A recent statement issued by the Cunard Steamship Company in advertising the *Caronia,* a ship of twenty thousand tons gross, put into service in 1905, may be cited to illustrate the policy of one of the companies that is making special efforts to develop third-class traffic. "For some years past," the company states, "the business of the Atlantic ferry has been changing in character. There has been a growing demand for second-class accommodation.

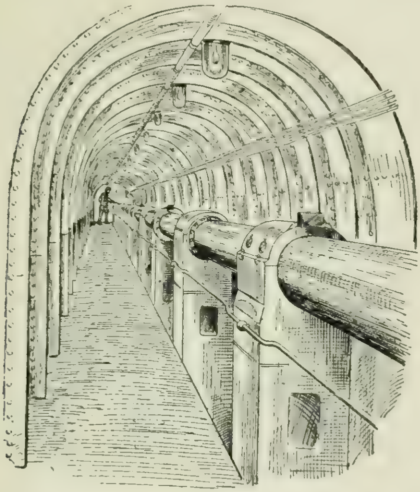


Arrangement of the Engines, Shafts, and Propellers of the *Carmania.*

Luxurious travel for those who can afford to pay high prices, very unluxurious travel for those whose means run only to steerage fares, with a somewhat timid and indifferent concession to the intermediate clientele, will no longer meet the case. Like the railway companies ashore, so the steamship companies afloat have discovered that it is to their interest to cultivate the second- and third-class passenger" traffic.

In the *Caronia* and its sister ship, the *Carmania*, the second-class passengers are given accommodations but slightly less comfortable than those provided the first class. However, it is in the third class that the most important

step has been taken. The Cunard Company has recognized the fact that "there is a large class of steerage passengers who are not emigrants, and that this traffic is capable of great expansion." To accommodate the steerage passengers who are not emigrants in such a way as to make the voyage attractive to them, the Cunard Company has divided the steerage into two classes, one class being for the emigrants, and a higher class being for



ONE OF THE *Carmania's* PROPELLER SHAFTS.

steerage passengers who are not emigrants. Accommodation is provided for one thousand emigrants and one thousand third-class passengers. The third-class passengers may engage reserved berths in staterooms. Their accommodations are provided with bathrooms and with a separate dining saloon, and their quarters are equipped with electric fans to provide adequate ventilation.

The competition of ocean steamship companies with

each other to secure the passenger traffic has resulted—as has been true with interrailway competition in the United States—in the development of a faster and more luxurious service, but has not brought about a decrease in the fares charged for the first and second classes. European railways have long since recognized that the greater profits were to be obtained by making attractive the service provided for passengers traveling in classes below the second, and foreign railway companies have catered to the lower classes of traffic with the result that there has been an enormous increase in the persons traveling in the third and lower class. The ocean steamship lines are apparently adopting the policy of the European railway companies, by catering to the lower classes of traffic, where there are the greatest possibilities of increasing the volume of business. The general adoption of this policy by ocean steamship companies will doubtless have the same effect that the policy has had in the railway passenger traffic, where the trend of traffic has been from the upper to the lower classes.

### REFERENCE FOR FURTHER READING

"The Statistical Abstract of the United States," prepared by the Bureau of Statistics, Department of Commerce and Labor. (This annual publication gives the figures regarding ocean passenger travel and immigration.)

# CHAPTER VII

## THE OCEAN MAIL SERVICE

During the year ending June 30, 1905, there were 12,684,821 pounds (6,342 tons) of mail dispatched by sea from the United States, and it is probable that the weight of incoming mail matter was nearly as much. About one fourth of our outbound over-sea mail went to three countries—Great Britain, Germany, and France—and over half of the total went to European countries. It is estimated that the number of pieces of mail matter sent and received in the foreign mails (including those carried by rail to and from Canada and Mexico) during the fiscal year 1905 was 441,774,494. The rapidity of the growth of the foreign-mail service may be indicated by comparing the figures just given with those for 1890, when the weight of mail matter dispatched over-sea was but 4,330,073 pounds, and the total number of pieces in our inbound and outbound foreign mails was 191,413,760.

The total cost of transporting our foreign mails to other countries during 1905 was $2,899,005. We paid foreign governments about one fifth of a million dollars for forwarding our mails within their countries, and received from other countries nearly the same amount for carrying inbound foreign mails across our country, or to interior points of destination within the United States. The actual cost of our foreign mail service, exclusive of the cost of transporting our outbound mail from interior points to the seaboard post offices, was slightly over two and one half

million dollars ($2,670,798.43) during the fiscal year 1905.

These expenses are more than covered by the postage received. According to the report of the Postmaster-General for 1905, "it is estimated that the sum of $6,219,-299.25 was received by this department as postage on articles exchanged with all foreign countries, and that of that sum the postage collected on the articles exchanged with countries other than Canada and Mexico amounted to $4,711,215.03, or $2,040,416.60 more than the net cost of the service; . . . so that it may be safely assumed that, even after adding the expense of transporting the articles between the United States exchange offices and the offices of mailing or delivery in this country, of which this office has no data upon which to base an intelligent estimate, the postage collected in the United States largely exceeds the gross expense incurred by this department in connection with the mails exchanged with foreign countries."

The United States pays the steamship companies that carry the ocean mails in one of two ways: (1) by a contract based upon the length of the route and speed of the vessel, and (2) by a payment based upon the amount of postage received by the United States from the mail carried.

The contract service is based upon the law passed by Congress, March 3, 1891, which empowers the Postmaster-General to make contracts running from five to ten years for the carriage of the mails upon steamers of American register, officered by Americans, and manned by a crew at least one half of whom, after the first five years of the contract, must be composed of American citizens. Steamers are divided into four classes: those in the first class must be iron or steel ships of not less than 8,000 tons gross register, and capable of maintaining at least 20 knots speed; the second class consists of iron or steel steamers

of not less than 5,000 tons gross register and 16 knots speed; the third class of iron or steel steamships of at least 2,500 tons and 14 knots; and the fourth class of iron, steel, or wooden steamers of 1,500 tons or more and 12 knots speed. Steamers of the first, second, and third classes must be so constructed as to be convertible into auxiliary naval cruisers and they may be taken over by the United States for transports or cruisers upon payment of a fair value to the owners. Each vessel of all four classes is required to "take, as cadets or apprentices, one American-born boy under twenty-one years of age for each one thousand tons gross register, and one for each majority fraction thereof, who shall be educated in the duties of seamanship, rank as petty officers, and receive such pay for their services as may be reasonable." Ships of the first class may receive, for carrying the mails, four dollars a mile, "by the shortest practicable route, for each outward voyage." Ships of the second class may receive two dollars a mile for the outward voyage; ships of the third class, one dollar a mile; and of the fourth class, two thirds of a dollar "for the actual number of miles required by the Post-Office Department to be traveled on each outward-bound voyage." The payment does not depend upon the weight of mail carried, but upon distance and speed.

For some years past seven contracts under the above law have been in force; and during 1905 the United States paid $1,431,620 to the contracting companies. The largest contract is with the American Line of the International Mercantile Marine Company for a weekly service from New York to Southampton, for which the United States paid $662,688 in 1905. For this service ships only of the first class are eligible. The second largest contract is with the Oceanic Steamship Company to carry the mails from San Francisco via Honolulu, Pago Pago (Samoa), and Auckland (New Zealand) to Sydney, Australia; the com-

pensation for this service in 1905 being $299,862. In this service the vessels are of the second class, for which the payment is two dollars a mile. The other contracts cover the transportation of the mails to Cuba, Mexico, Jamaica, and Venezuela.

When an American steamer carries the foreign mails of the United States without a special contract, the payment for the service equals the entire amount of the postage; but a foreign vessel receives only a fraction of the postage. Stated specifically, "steamers flying the flag of the United States, but not under contract, are allowed for their services all the postage collected on the mails they carry from this country; that is to say, five cents a half ounce—$1.60 a pound (or $3,200 a short ton)—for letters and post cards; and one cent for two ounces—eight cents a pound (or $160 a short ton)—for other articles. In the case of a steamer conveying the mails under a foreign flag, compensation for the service is allowed at the rate of 44 cents a pound (or $880 a short ton) for letters and post cards, and 4½ cents a pound (or $90 a short ton) for other articles, calculated on the actual net weight of the mails conveyed."[1]

In addition to the payments made for carrying ocean mails under the two services just explained—the "contract" and "noncontract" services—there are certain other expenses for the transportation of our foreign mails: (1) The United States paid in 1905 to the Governments of France, the Netherlands, the Bahamas, British Honduras, and Japan, in the aggregate $65,440 "for the conveyance of United States mails and foreign closed mails by steamers subsidized by said governments." (2) The Panama Railroad Company received $35,786 in 1905 for carrying mail from Colon to Panama. (3) The steamboat transfer service in New York harbor cost $38,000. (4) Sea post

[1] "Report of the Post-Office Department," 1904, pp. 465, 466.

offices were maintained on thirteen fast steamers of four North Atlantic lines—the North German Lloyd, Hamburg-American, the International Mercantile Marine, and the White Star companies.

The sea post offices and the transfer service in New York greatly expedite the delivery of our incoming mails, and reduce the amount of sorting to be done at the New York post office. During the trip across the ocean the clerks in charge of the sea post offices sort the mail and sack it with reference to the main distributing centers in the United States. When the ocean steamer reaches the quarantine station in lower New York Bay, it is met by a special mail steamer of the transfer service, "which receives the mails and conveys them as rapidly as possible to the various wharves, when the mails for the city of New York are immediately sent to the post office in that city, and those for inland destinations are forwarded by the first outgoing trains."

The United States Government has entered into numerous international agreements providing for sending parcels through the foreign mails. Parcels up to 3 feet 6 inches in length and up to 4 pounds 6 ounces (2 kilograms) in weight may be sent to or received from Germany, Belgium, Norway, Japan, and Hongkong. Our other parcels-post agreements permit the shipment of packages weighing 11 pounds (5 kilograms).[1] During the year ending June 30, 1905, the mail matter dispatched from the United States by the parcels post weighed 560,228 pounds. Four years earlier the weight was but 138,198 pounds.

[1] The countries and sections covered by our parcels-post agreements, in 1905 were the Bahamas, Barbados, Colombia, Costa Rica, the Danish West Indies, British Honduras, Jamaica, Leeward Islands, Mexico, Salvador, British Guiana, Windward Islands, Newfoundland, Honduras, Trinidad, Chile, Germany, Guatemala, Nicaragua, New Zealand, Venezuela, Bolivia, Hongkong, Japan, Norway, Belgium, Australia, Panama Canal Zone, and Guam.

The weight of parcels received into the United States from foreign countries in 1905 was 232,773; this, however, is less than the weight of the packages received in 1901, the first year for which a record was kept; the reason for this being that our former arrangement with Germany—the country from which we receive most parcels—permitted the exchange of packages weighing 11 pounds (5 kilograms), whereas at the present time the maximum weight for Germany and the United States is 2 kilograms (4 pounds 6 ounces). The average weight of the parcels received and sent by us through the parcels post in 1905 was $3\frac{1}{3}$ pounds, and the average for the parcels dispatched was a little over 3 pounds.

As the recent annual reports of the United States Superintendent of Foreign Mails have well stated, "the parcels post affords the only channel for the legitimate exchange of packages of miscellaneous merchandise by mail between different countries. It, in fact, gives to persons in different countries substantially the same facilities for the exchange of small parcels as is afforded in our domestic mail by the provision for the admission to the mails of fourth-class matter." The international parcels post constitutes a useful addition to our postal facilities, and the development of this branch of the postal service would be a public benefit.

The development of the international postal service has been aided by the Universal Postal Union that was established by a treaty, called the Universal Postal Convention, concluded at Berne, Switzerland, October 9, 1874. Nearly all the governments in the world are members of this union, and, in the case of most countries, the postage on sealed letters is five cents per half ounce, with a two-cent rate for post cards, and a half cent an ounce for printed matter. Throughout most parts of the British Empire the letter rate is one penny, or two cents. The

postal rates between the United States and its noncontiguous possessions is the same as the rate within the United States. Our domestic postal rates also apply to mails sent to Canada, Mexico, and Cuba.

The Universal Postal Union maintains at Berne a central office, called the International Bureau. This bureau is in charge of a director, and is under the supervision of the Swiss Postal Administration. The expenses of the bureau are borne by the governments that are members of the union. "That bureau is charged with the duty of collecting, collating, publishing, and distributing information of every kind which concerns the international postal service; of giving, at the request of the postal administrations concerned, an opinion upon questions in dispute; of making known propositions for modifying the acts of the Congress (the Universal Postal Congress); of giving notice of the changes adopted; and, in general, of undertaking such researches and labors as may be intrusted to it in the interest of the Postal Union."[1]

The Universal Postal Congress, composed of delegates from the governments belonging to the Universal Postal Union, convenes once in five years, its last session convened in April, 1906, at Rome, Italy. It is the legislative body that controls the policy of the union, and decides upon the rules and regulations to be observed by the members of the union in the management of their foreign-mail service.

The ocean-mail service has had a stimulating influence upon the development of ocean transportation generally. As with the passenger traffic, so with the carriage of the mails, speed is necessary, and steamship companies, in order to secure the liberal payments which governments are willing to make for a fast mail service, have steadily sought to reduce the time required for ocean transit.

[1] "Report of the Post-Office Department, 1904," pp. 461, 462.

Moreover, in making contracts with steamship companies for the carriage of the foreign mails, most governments include with the transportation of the mails various requirements as to frequency and speed of the service, and sometimes there are requirements regarding the passenger and freight accommodations to be afforded by the mail steamers. For these services intended to aid commerce the Government often remunerates the carrier by liberal payment for carrying the mails. Ship subsidies not infrequently take the form of mail payments; the Government requiring the vessels that carry the mail to be of home registry, to be built in domestic shipyards, and officered and manned in whole or in part by citizens of the contracting country.

In the subsequent discussion of Government aid to shipping, the policy of the United States and other countries will be considered, and the discussion will show that the payments for the carriage of the ocean mails have been influential in developing the ocean transportation facilities of several countries.

### REFERENCES FOR FURTHER READING

"Annual Report of the Post-Office Department." (The annual reports of the Superintendent of Foreign Mails to the Postmaster-General contain a good account of the ocean-mail service.)

"The Navigation Laws of the United States," published by the Bureau of Navigation, Department of Commerce and Labor. (This gives the laws relating to the ocean-mail service. A revised edition appears every few years.)

## CHAPTER VIII

### THE INTERNATIONAL EXPRESS SERVICE

A SMALL but increasing volume of international traffic consists of express matter, including parcels of relatively high value as compared with their weight, papers and documents, printed matter too heavy for transmission by mail, paper money and coin, and, in general, such articles as require especially rapid and safe transportation and a prompter delivery than can be secured by means of the freight service.

The line separating freight from express traffic is not a sharp one, but the charges on foreign express matter are necessarily so high as practically to confine international express to parcels. The boundary between freight and express is more definite in international traffic than in domestic traffic by rail, where commodities ordinarily shipped as freight may be sent as express whenever their prompt delivery is especially important.

The companies that conduct a foreign express service also carry on an international banking business to some extent, by selling travelers' checks that can be cashed in any one of a large number of foreign cities. These checks are purchased in increasing numbers by tourists, some persons preferring the checks to the customary letter of credit.

Three companies in the United States now conduct a foreign express service: the American Express Company, the United States Express Company, and Wells, Fargo and Company. The express service between the United

States and Europe was organized soon after the inauguration of the domestic express business in the United States. William Harnden, about 1839, first organized the express service in the United States, and within a short time started a service between the United States and Europe, probably because, in 1840, Alvin Adams began competing for the domestic express business. Harnden found the foreign business profitable, and gave it more attention than the domestic business, which Adams steadily enlarged. In 1854, Harnden and Company and Adams and Company consolidated with two other firms and formed the Adams Express Company.

The American Express Company was formed in 1850, by the combination of two existing firms, and became an active competitor of the Adams Company. However, the express business in the United States came to be controlled by a few large companies that were easily able to restrain competition by dividing the field or by agreeing upon common rates for like services. The Adams Express Company withdrew from the international business, leaving the express traffic with Europe to the American and United States Express companies. The transpacific traffic is carried on mainly by Wells, Fargo and Company.

There are no statistics published of the domestic or foreign express traffic handled annually by American companies. The American Express Company has the largest traffic of the three main companies doing a foreign business, and is apparently giving more attention than are the other companies to the development of the international traffic. This is indicated by the fact that the American Express Company recently entered into a parcels-post agreement with the British Government. Packages accepted by the British Post Office for delivery by parcels post in the United States are consigned to the American Express Company for delivery; likewise the

# READ THE CONDITIC

NEW YORK CITY OFFICES:
Gen'l Office, 72 Broadway, nr. Wall St.
PRINCIPAL BRANCH OFFICES:

42 West Broadway.
32 Canal Street.
5 West 14th Street.
434 Broadway.
31 Columbus Avenue.
275 West 12th Street.

# COLUMBIAN

**72 Broadway,**

*Received of* ______________________

______________________ NOT NE

*Value asked and* ______________________ *given as* ______________________

*Marked* ______________________

**Which this Company undertakes to forward to the nearest point**
**which conditions are agreed to by sl**

**1.** This Company is not to be held liable for any loss or damage, except **as forwarde**
**only**, nor for any loss, damage, or delay, by the dangers of navigation, by the act of God or of t
enemies of the Government, by the restraints of Government, strikes, mobs, riots, insurr
tions, pirates, or from or by reason of any of the hazards or dangers incident to a state of w
**2.** Nor shall this Company be liable for any default or negligence of any person, corpo
tion or association to whom the said property shall or may be delivered by this Compa
for the performance of any act or duty in respect thereto, at any place or point off the est
lished routes or lines run by this Company; and any such person, corporation, or associati
is not to be regarded, deemed or taken to be the agent of this Company for any s
purpose, but, on the contrary, such person, corporation or association shall be deemed
taken to be the agent of the person, corporation or association from whom this Compa
received the said property. It being understood that this Company relies upon the vari
Railroad and Steamboat lines of the country for its means of forwarding property de
ered to it to be forwarded, it is agreed that it shall not be liable for any loss or dama
caused by the detention of any train of cars or of any steamboat or other vehicle in
which said property shall be placed for transportation, nor by the neglect or refusal of a
Railroad Company, Steamboat or other transportation line to receive and forward the s
property. Nor shall this Company be liable for any losses or damages caused by detenti
of said property due to Customs Regulations.
**3.** It is further agreed that property covered by this receipt and passing over oc
routes in transit shall be subject to the conditions expressed in the Bills of Lading
**Ocean Steamship Companies accepted for the shipment.**
**4.** It is further agreed that this Company is not to be held liable or responsible for a
loss of, or damage to, said property or any part thereof, from any cause whatever, unl
in every case the said loss or damage be proved to have occurred from the fraud or gr

**For the Compa**

**The Liability of this Company is limited to $50, unless the just and true**
**therefor, based upon such higher value; and such liability**
**destination it can carry same. Fragile fabrics and f**

EXPRI

IS OF THIS RECEIPT. (212—Jan., 1905.)

# EXPRESS COMPANY.

lew York, ______________ 190____

______________

——*said to contain*——————

OTIABLE ———————— Dollars, 100

lestination reached by it, subject to the following conditions, and er or owner in accepting this receipt.

negligence of said Company or its servants; nor in any event shall this Company be held iable or responsible, nor shall any demand be made upon it beyond the sum of **Fifty Dollars,** unless the just and true value thereof is stated herein, and an **extra charge s paid or agreed to be paid therefor, based upon such higher value; nor upon any property or thing unless properly packed and secured for transportation; nor upon any fragile fabrics, or any fabrics consisting of, or contained in glass.**

5. If any sum of money besides the charges for transportation is to be collected from the consignee on delivery of the said property, and the same is not paid, or if in any case the consignee cannot be found or refuses to receive such property, or for any other reason it cannot be delivered, the shipper agrees that this Company may return said property to him subject to the conditions of this receipt, and that he will pay all charges for transportation, and that the liability of this Company for such property while in its possession for the purpose of making such collection, shall be that of Warehousemen only.

**6. In no event shall this Company be liable for any loss, damage or delay, unless the** claim therefor shall be presented to it in writing to this office within **ninety days** after date of shipment, in a statement to which this receipt shall be annexed.

7. It is further agreed that any carrier or party liable on account of loss or damage to any of the said property, shall have the **full benefit of any insurance** that may have been effected upon or on account of said property.

8. And it is also understood that the stipulations contained herein shall extend and inure to the benefit of each and every company or person to whom, through this Company, the said property may be entrusted or delivered for transportation.

9. Deliveries at destination are only to be made within the delivery limits established at such points at the time of shipment and prepayment in such cases shall only cover places within such delivery limits.

,

______________ Agent.

**ue is stated in this receipt and an extra charge is paid or agreed to be paid es on delivery by the Company of property at nearest point to cs consisting of, or contained in glass, at owner's risk.**

RECEIPT.

American Express Company employs the parcels post in the United Kingdom to deliver packages consigned to points in that country. It is said that the American Express Company contemplates making contracts of a similar character with other European countries; unless, as is not probable, the United States Post-Office Department should decide to enlarge its international parcels-post service by making agreements with more countries providing for the transportation by mail of packages weighing over four pounds, six ounces.

All three companies, however, have the same general organization of their foreign service and follow the same business methods. The foreign department of an express company performs the services of an international forwarder; but the express companies in the United States do not maintain business organizations of their own in foreign countries similar to the organization they have at home. The express traffic they have in foreign countries is not large enough to require this; consequently the express company in the United States enters into reciprocal agreements with forwarding agents in Europe and elsewhere. The American party to the agreement engages to consign to its foreign agent all express matter which the American company may receive destined to points in the territory covered by the operations of the foreign agent. Likewise, the foreign party to the contract obligates himself to forward to the American company with which he has an agreement all express he may receive destined for points in the United States, and not otherwise specifically consigned.

The express company receiving parcels for shipment abroad gives the shipper a receipt or bill of lading. In the case of a single small shipment the shipper is given a *receipt*, the form of which is the same as for a domestic shipment. When the consignment is a large one the

shipper receives a freight export *bill of lading* describing the goods, giving the name of the shipper and the consignee, the destination of the goods, weight and description of the articles, and the rates or amount of agreed through charges. The bill of lading is ordinarily made out in triplicate, one copy being given to the shipper, one retained by the express company, and one forwarded to the express company's foreign correspondent or agent. The express company makes out a *way bill* covering the shipments made by the steamship upon which goods are sent abroad. This is the express company's own record, and describes the articles, states the origin and destination of the goods described, and gives the weight, freight charges, total, prepaid, and to be collected. The express company receives from the steamship company the customary bill of lading describing the goods shipped, and containing the contract between the express company and the steamship company. The bill of lading issued by the express company and forwarded to its correspondent or agent abroad must be accompanied by *shippers' invoices* or *manifests* stating the value of the goods, so that the foreign agent may secure the entry of the commodities at the customs house.

The express company makes no special contract with the steamship company for the transportation of express matter, its relations with the ocean carrier being like those of other shippers. In this regard the foreign express service differs from the domestic. In the domestic business, the express company makes a contract with a railroad company whereby the express company is granted a monopoly of the express traffic handled over that railroad. The railroad company furnishes the requisite cars or car space for transporting the express matter, and hauls the cars, and receives for this service from forty to fifty per cent of the gross receipts obtained by the express company. The express company collects, dispatches, and delivers the pack-

ages, employing the railroad, by special contract, to transport the traffic.

In the foreign-express traffic, on the contrary, the express company makes an agreement with the ocean carrier, as other shippers do, for each separate voyage, to carry such matter as may be offered for that trip at the rates charged by the carrier for the class and quantity of goods offered for shipment. The express company ships its foreign traffic by the steamer and line that may have the first sailing, instead of dispatching its packages by only one line of vessels. The international express traffic being relatively small in volume and more or less intermittent, this plan of shipping goods without a special contract is economical and satisfactory.

The foreign-express service has a competitor in the international parcels post, described in the previous chapter. The volume of traffic now carried between the United States and foreign countries by the parcels post is not large, for the reason that there are only a few countries with which we have a large exchange of mail that we have thus far included in our parcels-post agreements. Moreover, in our agreements with several of the more important countries we have restricted the weight of a package that may be sent by the parcels post to 4 pounds 6 ounces (2 kilograms), our reason for this restriction being the 4-pound limit placed upon packages that may be mailed to points within our country.

This restriction upon the weight of packages that may be sent through the domestic and foreign mails limits greatly the competition of the mail service with the express business. There are strong reasons in favor of enlarging the scope of the domestic-mail service in the United States by increasing the weight of packages that may be transmitted by mail up to a limit of ten, or possibly fifteen pounds.

The arguments in favor of the establishment of a parcels post in the United States are that the Government could conduct the service more economically than express companies can, and could consequently charge lower rates than now prevail. The Government has post offices in all parts of the country, and numerous branch offices in different sections of the large cities. The machinery for collection and distribution is elaborate, and has recently been extended to include many rural districts. "The Government would need only to enlarge its present service, which it could do with a relatively small increase of expenses, in order to include all the traffic in small packages now handled by the express companies. . . . Whether or not the time has come for increasing the competition of the mail with the express business, there is little doubt that the post office could handle packages up to ten or fifteen pounds in weight without loss at rates much lower than those now charged by the express companies. If the Government's competition were extended, the rates charged by the private companies would probably be lowered. . . . The express business, while not a complete monopoly, is one in which competition is confined to narrow limits."[1]

While the international express business is not so completely monopolistic as is the express business within the United States, the competition among companies doing a foreign express service is not keen. The present rates are high, and a large development of international express traffic can hardly take place unless lower charges are possible. Most of the arguments in favor of domestic parcels post within the United States apply to the establishment by our country of a foreign parcels post with a weight limit of at least 11 pounds (5 kilograms) per package. By establishing such a service at rates that would cover only

[1] See pp. 166 and 167 of the author's book on "American Railway Transportation."

the expenses of the service, the United States could facilitate the development of international intercourse. Such a policy on the part of the United States would limit the development of the international express service performed by private companies in the United States, and would doubtless cause these companies to specialize upon the performance of services other than the transmission of packages of merchandise. This would be a detriment to the private express company, but would be of benefit to the people of the United States.

### REFERENCE FOR FURTHER READING

Johnson, E. R. "American Railway Transportation." Chapter XI. (This chapter gives an account of the express service of American railways.)

## FREIGHT EXPORT BILL OF LADING.

# COLUMBIAN EXPRESS COMPANY.

NEW YORK, 72 Broadway. ST. LOUIS, 17 North Fourth St.
CHICAGO, 65 Monroe St. BOSTON, 431 Franklin St.

**(B/L No.**________ **Contract No.** ________)

**Received at**________________________

**From**________________________

the following property, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned and destined as indicated below, to be carried to the Port of NEW YORK / BOSTON and thence by________________ ________[Scheduled to sail________sailed________] or the next available steamer (or line) and to be delivered in like order and condition to Port of____________
unto________________________
at____________________or his or their assigns:
(ARTICLES)____________________

| MARKS, NUMBERS OR ADDRESS ON GOODS | SUBJECT TO CORRECTION | | | VALUE |
|---|---|---|---|---|
| | WEIGHT | CUBICAL MEAS'T | | |
| | | FEET | INCHES | |
| | | | | |

APPLY for delivery to____________________
The Agent or Correspondent of COLUMBIAN EXPRESS CO., named above will NOTIFY____________________
where and through whom final delivery of goods will be made.

# CHARGES - - { Prepaid by Shipper as Below. / Collect of Consignee as Below.

| FOR | FROM | TO | @ | P R | AMOUNT |
|---|---|---|---|---|---|
| CARRIAGE | | | | | |
| CARRIAGE | | | | | |
| | | | | | |
| | | | | | |

Marine Insurance for sum of____________________ { Prepaid. / Collect.

**In Witness Whereof,** The Agent of the said COLUMBIAN EXPRESS CO., hath affirmed to ____Bills of Lading, all of this tenor and date, one of which being accomplished the others stand void.

Dated at____________this__________day of____________190

____________________Agent.

EXPRESS COMPANY'S EXPORT BILL OF LADING.

**In consideration of the Rate of Freight herein named, it is hereby stipulated that the service to be performed hereunder shall be subject to the conditions, whether printed or written, herein contained, and said conditions are hereby agreed to by the shipper and by him accepted for himself and his assigns as just and reasonable.**

## CONDITIONS:

**With respect to the service UNTIL DELIVERY at the port of New York or Boston, it is agreed that:**

1. No carrier or party in possession of all or any of the property herein described, shall be liable for any loss thereof or damage thereto, by causes beyond its control; or by floods or by fire; or by quarantine; or by riots, strikes or stoppage of labor; or by leakage, breakage, chafing, loss in weight, changes in weather, heat, frost, wet or decay; or from any cause if it be necessary or is usual to carry such property upon open cars.

2. No carrier is bound to carry said property by any particular train or vessel, or in time for any particular market, or otherwise than with as reasonable despatch as its general business will permit. Every carrier shall have the right, in case of necessity, to forward said property by any railroad or route between the point of shipment and the point to which the rate is given.

3. No carrier shall be liable for loss or damage not occurring on its own road or its portion of the through route, nor after said property is ready for delivery to the next carrier or to consignee. The amount of any loss or damage for which any carrier becomes liable shall be computed at the value of the property at the place and time of shipment under this bill of lading, unless a lower value has been agreed upon or is determined by the classification upon which the rate is based, in either of which events such lower value shall be the maximum price to govern such computation. Claims for loss or damage must be made in writing to the agent at point of delivery promptly after arrival of the property, and if delayed for more than thirty days after the delivery of the property, or after due time for the delivery thereof, no carrier hereunder shall be liable in any event.

4. All property shall be subject to necessary cooperage and baling at owner's cost. Each carrier over whose route Cotton is to be carried hereunder shall have the privilege, at its own cost, of compressing the same for greater convenience in handling and forwarding, and shall not be held responsible for deviation or unavoidable delays in procuring such compression. No carrier shall be liable for differences in weights or for shrinkage of any grain or seed carried in bulk.

5. Property not removed by the person or party entitled to receive it within twenty-four hours after its arrival at destination, may be kept in the car, depot or place of delivery of the carrier, at the sole risk of the owner of said property, and there held subject to lien for all freight and other charges. Property taken from a station at which there is no regularly appointed agent, shall be entirely at risk of owner until loaded into cars; and when received from private or other sidings, shall be at owner's risk until the cars are attached to trains.

6. No carrier hereunder will carry, or be liable in any way for any documents, specie, or for any article of extraordinary value not specifically rated in the published classifications, unless a special agreement to do so, and a stipulated value of the articles are endorsed hereon.

7. Every party, whether principal or agent, shipping inflammable, explosive, or dangerous goods, without previous full written disclosure to the carrier of their nature, shall be liable for all loss or damage caused thereby, and such goods may be warehoused at owner's risk and expense or destroyed without compensation.

8. Any alteration, addition, or erasure in this bill of lading which shall be made without the special notation hereon of the agent of the carrier issuing this bill of lading shall be void.

9. If upon inspection it is ascertained that the articles shipped are not those described in this bill of lading, the freight charges must be paid upon the articles actually shipped, and at the rates and under the rules provided for by published classifications.

10. If all or any part of said property is carried by water over any part of said route, such water carriage shall be performed subject to the further conditions that no carrier or party shall be liable for any loss or damage resulting from the perils of the lakes, sea or other waters; or from explosion, bursting of boilers, breakage of shafts, or any latent defect in hull, machinery or appurtenances; or from collision, stranding, or other accidents of navigation; or from the prolongation of the voyage. And any vessel carrying any or all of the property herein described shall have liberty to call at intermediate ports; to tow and be towed, and to assist vessels in distress, and to deviate for the purpose of saving life or property.

11. No carrier shall be liable for delay, nor in any other respect than as warehousemen, while the said property awaits further conveyance, and in case the whole or any part of the property specified herein be prevented by any cause from going from said port in the first steamer, of the ocean line above stated, leaving after the arrival of such property at said port, the carrier hereunder then in possession is at liberty to forward said property by succeeding steamer of said line, or, if deemed necessary, by any other steamer.

12. This contract is executed and accomplished, and all liability hereunder terminates, on the delivery of the said property to the steamship, her master, agent or servants, or to the steamship company, or on the steamship pier at the said port, and the inland freight charges shall be a first lien, due and payable by the steamship company.

**With respect to the service AFTER DELIVERY at the port of NEW YORK or BOSTON, it is Mutually agreed that:**

The ship shall have liberty to sail with or without pilots; that the Carrier shall have liberty to convey goods in craft and or lighters to and from the ship at the risk of the owners of the goods; and, in case the ship shall put into a port of refuge, or be prevented from any cause from proceeding in the ordinary course of her voyage, to tranship the goods to their destination by any other steamship; that the ship and Carrier shall not be liable for loss or damage occasioned by perils of the sea or other waters, by fire from any cause or wheresoever occurring; by barratry of the master or crew; by enemies, pirates, robbers or thieves; by arrest and restraint of princes, rulers or people, riots, strikes or stoppage

of labor, by explosion, bursting of boilers, breakage of shafts, or any latent defect in hull, machinery or appurtenances, or unseaworthiness of the ship, whether existing at time of shipment or at the beginning of voyage, provided the owners have exercised due diligence to make the vessel seaworthy; by heating, frost, decay, putrefaction, rust, sweat, change of character, drainage, leakage, breakage, vermin, or by explosion of any of the goods whether shipped with, or without, disclosure of their nature, or any loss or damage arising from the nature of the goods, or the insufficiency of packages; nor for land damage, nor for the obliteration, errors, insufficiency or absence of marks, numbers, address or description; nor for risk of craft, hulk or transshipment; nor for any loss or damage caused by the prolongation of the voyage, and, that the Carrier shall not be concluded as to correctness of statements herein of quality, quantity, gauge, contents, weight and value. General Average payable according to York-Antwerp Rules. If the owner of the vessel shall have exercised due diligence to make said vessel in all respects seaworthy and properly manned, equipped and supplied, it is hereby agreed that in case of disaster resulting from fault or negligence of the pilot, master or crew in the navigation or management of the ship, or from latent or other defects, or unseaworthiness of the vessel, even existing at time of shipment, or at the beginning of the voyage, but not discoverable by due diligence, the consignees or owners of the cargo shall not be exempted from liability for contribution in General Average, or for any special charges incurred, but, with the shipowner, shall contribute in a General Average, and shall pay such special charges, as if such danger, damage or disaster had not resulted from such fault, negligence, latent or other defects or unseaworthiness.

IT IS ALSO MUTUALLY AGREED that this shipment is subject to all the terms and provisions of, and all the exemptions from liability contained in, the Act of Congress of the United States, approved on the 13th day of February, 1893.

I. IT IS ALSO MUTUALLY AGREED that the Carrier shall not be liable for articles specified in Section 4281 of the Revised Statutes of the United States, nor for any package exceeding the sum of $100 in value, unless notice of true character and value thereof is given and same is entered in the bill of lading.

II. ALSO, that Shippers shall be liable for any loss or damage to ship or Cargo caused by inflammable, explosive or dangerous goods, shipped without full disclosure of their nature, whether such Shipper be Principal or agent, and such goods may be thrown overboard or destroyed at any time without compensation.

III. ALSO, that the Carrier shall have a lien on the goods for all freights, primages and charges, and also for all fines or damages which the ship or cargo may incur or suffer by reason of the illegal, incorrect or insufficient marking, numbering or addressing of packages or description of their contents. Furthermore all charges or expenses incurred through non-compliance with Customs Requirements will be charged to consignee. The shipper hereby further expressly agrees, if the goods are not accepted by consignee, to pay the carrier all freights, primage, charges and Custom expenditures; and in case such goods are seized or sold, to pay the said Carrier for any and all losses resulting by reason thereof, including all freight and other charges.

IV. ALSO, that in case the Ship shall be prevented from reaching her destination by Quarantine, the Carrier may discharge the goods into

any Depot or Lazaretto, and such discharge shall be deemed a final delivery under this contract, and all the expenses thereby incurred on the goods shall be a lien thereon.

V. ALSO, that the Ship may commence discharge immediately on arrival, and discharge continuously, any custom of the port to the contrary notwithstanding, the Collector of the Port being hereby authorized to grant a general order for discharge immediately on arrival, and if the goods be not taken from the ship by the Consignee directly they come to hand in discharging the ship the Master or ship's Agent to be at liberty to enter and land the goods, or put them into craft or store at the owner's risk and expense, when the goods shall be deemed delivered and the ship's responsibility ended, but the ship and Carrier to have a lien on such goods, until the payment of all costs and charges so incurred.

VI. ALSO, that full freight is payable on damaged or unsound goods; but no freight is due on any increase in bulk or weight caused by the absorption of water during the voyage.

VII. ALSO, that if on a sale of the goods at destination for freight and charges, the proceeds fail to cover said freight and charges, the Carrier shall be entitled to recover the difference from the shipper.

VIII. ALSO, that in computing the amount of any liability of carrier, ship or representatives as carrier, bailee or otherwise, hereunder or for or in respect to said property of the care, carriage, delivery or disposition of the same for negligence or otherwise, no higher value shall be placed upon said property than the market price at the port of destination on the day of the steamer's entry at the Custom House, but in no case shall it be more than the invoice cost thereof at time of original shipping or value herein agreed upon, whichever is less, and in no event shall carrier, ship or representative be liable for any profits or increase in price or value over such cost or agreed value, whichever is less, or any consequential or special damages, and the carrier shall always have the option of replacing any lost or damaged goods. All claims for short delivery, loss, damage, or of whatsoever nature, must be made in writing to the carrier's agent at the port of destination of the goods at time of delivery or in any event within five days after the goods arrive, and in case such claims shall not be presented in writing within the time and place hereinbefore designated, such loss or damage shall be deemed to be waived and the steamer and carrier discharged therefrom. And in no case shall the carrier be liable for any loss or damage arising by reason of theft, such loss or damage being an insurable risk.

IX. ALSO, that merchandise on wharf awaiting shipment or delivery be at shipper's risk of loss or damage by fire and or flood, not happening through the fault or negligence of the owner, master, agent or manager of the vessel, any custom of the port to the contrary notwithstanding.

X. ALSO, that this bill of lading, duly endorsed, be given up to the Agent of the Columbian Express Company in exchange for delivery order.

XI. ALSO, that the Freight prepaid will not be returned, goods lost or not lost.

XII. ALSO, that parcels for different Consignees collected or made up in single packages addressed to one Consignee, pay full freight on each parcel.

XIII. ALSO, that freight payable on weight is to be paid on gross weight landed from Ocean Steamship, unless otherwise agreed to or herein otherwise provided, or unless the Carrier elects to take the freight on the Bill of Lading weight.

XIV. ALSO, if the cubical measurement of goods upon remeasurement should exceed that given in margin hereof, or error is made in computing charges thereon, the Company reserves the right to correct same by collecting additional charges.

XV. ALSO, it is stipulated that in case the whole or any part of the articles specified herein be prevented by any cause from going in the first steamship leaving after the arrival of such articles at said port, the Carrier is only bound to forward them by succeeding steamships employed in this line, or if deemed necessary by said Carrier it may forward them in other steamships.

XVI. ALSO, that the property covered by this bill of lading is subject to all conditions expressed in the regular forms of bills of lading in use by the steamship company at time of shipment, including any special written or stamped conditions noted thereon by Steamship Company, and to all local rules and regulations at port of destination not expressly provided for by the clauses herein.

XVII. ALSO, that goods may be baled or coopered, if necessary, at expense of owners—costs to follow goods.

XVIII. ALSO, that the consignee in taking delivery of goods is to see that the marks and numbers agree with those given hereon, and is to carefully examine the condition of packages and if not in good order or packages bear evidence of pilferage of or damage to contents, delivery should only be taken with due reservation.

XIX. Goods which may be required to be forwarded by Rail, Steamer, or otherwise, to their destination, from the Ship's Port of Discharge, shall be so forwarded at Shipper's risk, and carried subject to the ordinary Conditions of Carriage of the Railway, Steam, or other Carrier employed, or subject to any special terms required by them. All liability of the ship and owners and Columbian Express Co. under this bill of lading to cease upon delivery of the goods to the succeeding carrier.

XX. In case the regular steamship service to final port of delivery should for any reason be suspended or interrupted, the carrier, at the option of the owner or consignee of the goods, or the holder of the Bill of Lading, may forward the goods to the nearest available port, this to be considered a final delivery; or to store them at any port at the risk and expense of the goods until regular service to final port of destination is opened again.

XXI. Freight and charges payable by consignee to be paid at current rate of exchange.

XXII. ALSO, in case of closing of port of destination by ice, right is reserved to unload cargo at nearest accessible port. Any expense incurred for so discharging with cost for carrying to destination will be at risk and expense of consignee.

XXIII. MARINE RISKS: The Columbian Express Company will not be responsible for losses arising from perils of the sea unless Marine Insurance is undertaken by the Company.

It is stipulated that any claim, demand or question, arising out of this shipment and bill of lading shall be determined according to the law of the State of New York.

AND FINALLY, in accepting this Bill of Lading, the Shipper, Owner and Consignee of the goods and the Holder of the Bill of Lading agree to be bound by all its stipulations, exceptions and conditions, whether written or printed, as fully as if they were all signed by such Shipper, Owner, Consignee or Holder.

From **COLUMBIAN EXPRESS CO.,** *72 Broadway, New York, per S. S.* ________ *To* ________ *W B No.* ____

| MARKS ON GOODS Articles—Contents—Value | FROM | CONSIGNEE AND DESTINATION | Weight | Advanced Charges | Our Charges | Total To Collect | PREPAID | REMARKS | |
|---|---|---|---|---|---|---|---|---|---|
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EXPRESS COMPANY'S WAY BILL.

# Owner's or Agent's Manifest of Articles exported by Railway. (Col. Ex. Co. 365 April, 1905.)

*List or manifest of articles of domestic production or manufacture, and of foreign articles free of duty, or duty paid, delivered by* ________________ (Name of Owner or Agent.)

*to Columbian Express Co. at* ________ *State of* ________ *Agent* ________ (Name of Ex. Agent.)

*For Exportation to M* ________________ (Name of Consignee.)

*At* ________________ (Name of place of intended Destination in Foreign Country.)

*via* ________________ (Name of last port in United States whence articles pass into the Foreign Country.)

| Marks and Numbers of Packages. | Description of Articles. | (1) Domestic Articles. | | (2) Foreign Articles Free of duty, or duty paid. | |
|---|---|---|---|---|---|
| | | Quantities. | Values. | Quantities. | Values. |
| | | | *Dollars.* | | *Dollars.* |
| | | | | | |
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*I,* ________________ (Name of Owner or Agent.) *hereby certify that the above is a full and true statement of the kinds, quantities and values, and destination of all the articles delivered by me for exportation as aforesaid.*

*Residence,* ________________

________________
[Signature of Owner or Agent.]

*Date,* ________________ *190*__

Any owner or agent may include in a single manifest all articles exported by him on one train.

SHIPPERS INVOICE OR MANIFEST OF GOODS EXPORTED BY EXPRESS.

# PART III

## THE OCEAN CARRIERS AND THE PUBLIC: THE RELATIONS OF THE CARRIERS WITH ONE ANOTHER AND THE PUBLIC

# CHAPTER IX

## ORGANIZATION OF OCEAN TRANSPORTATION

The ocean transportation service has developed from small beginnings. Ocean commerce was long carried in small sailing vessels usually owned by the shipper, who might be an individual merchant or trading company, a planter, a fisherman or group of fishermen, and who generally operated the ship or ships as single units, sending them when and where a prospect of profitable trading arose; but at the present time ocean transportation is a service of great magnitude, performed by large vessels, mainly steamers, operated in most instances by large companies that usually are carriers solely, and not producers or traders.

The typical ocean transportation company performs a highly organized service, and operates a large number of ships according to a well-defined plan. However, although the vessel owner is more often only a carrier, and not a producer, there are numerous manufacturing and mining companies that operate their own vessels; and during the past few years combinations in industry and the development of world markets have been accompanied by a tendency on the part of the producer to use his own ships to assemble his raw materials and to distribute his products. Similarly, many large railway systems, especially in Great Britain and the United States, have supplemented and increased their service of land transportation by establishing lines of vessels. This tendency of the large producer and

the strong railway company to become their own carriers by sea is, in a sense, a return to the earlier organization of ocean commerce, when merchants and producers traded by using their own ships; but ocean shipping is to-day a complicated business, quite unlike the simple organization which characterized the service a century or more ago.

While the large company is the typical ocean carrier, the individual or company owning, or operating upon a lease, one or a few ships is and will continue to be an important factor in ocean transportation. A vessel is readily purchased, or leased; the ocean is a highway free to all who desire to use it; at every port facilities are provided whereby the individual who owns no wharf or pier may dispatch or discharge cargoes; and as these conditions will always exist the large company can exclude the small carrier only by performing all the services desired by producers and shippers, and by doing those services more economically than they can be rendered by the man or company owning or leasing only a small tonnage of vessels. As will be explained presently, there are certain kinds of service that the large carrier can perform advantageously, and other services which the small carrier can render more satisfactorily and economically.

To explain the ocean transportation service—to discuss the economics of ocean transportation—the subject requires consideration in three different aspects: (1) The relations of the carriers with each other; (2) the relations of the carriers with the public, the shippers, and travelers who purchase the service; and (3) the relation of the carriers with the Government, the policy and practice of Government aid, and regulation of the service of ocean transportation.

In dealing with the relations of carriers with each other, it will be well, first, to describe briefly the evolution of the present organization of the service; second, to ex-

plain the nature, scope, and necessary limitations of the competition in the ocean transportation service; and, third, to give an account of the agreements, traffic associations, pools, and consolidations by means of which ocean carriers have sought to limit competition and to regulate their interrelations. In the present chapter the organization of the service will be considered, and in the two following chapters the nature of competition and efforts to regulate competition will be discussed.

The ocean carrier in the early stages was the individual trader, who took his own goods and those of his neighbors over-sea to exchange for the commodities, usually articles of luxury, and the precious metals, obtainable in foreign countries. When the trade thus became of some volume or gave evidence of being capable of large development, trading companies were formed, such as the British and Dutch East India companies, which frequently received from the Government chartering them the exclusive privilege of trading with the foreign territory covered by the charter. These famous companies, like the individuals and small companies of their time, were organizations formed to carry on trade, and ocean transportation was incidental to their trading business. They were not general carriers, such as a present-day steamship company is.

After the Dutch lost New Amsterdam, in 1664, the trading company had no place in the commerce of the American colonies, which was handled by the independent traders of Great Britain and the American colonies; and was, as a matter of fact, developed mainly by the colonists themselves, who, as fishermen, merchants, farmers, and planters, individually operated such vessels as their business required, or as their instinct for foreign ventures prompted. Conducted in this individual and unorganized manner, the over-sea trade of the colonies grew slowly, but more or less steadily, until the establishment of the Na-

tional Government under the Constitution made possible the rapid expansion of the maritime activities of America. The increasing trade of the people of the United States brought about both a technical improvement in shipping and a higher degree of organization in the service of ocean transportation.

The first result of the growth of the foreign trade of the United States during the latter part of the eighteenth century and the early years of the nineteenth was to develop the great merchant trader, such as Stephen Girard, of Philadelphia, and Elias Hasket Derby, of Salem, Mass. Girard was active in commerce from 1780 to 1812, and lived until 1831; Derby died in 1799. The manner of carrying on ocean commerce in Derby's time is well described by W. L. Marvin in his book on "The American Merchant Marine," in the following passage (p. 198): "Those old Salem merchants were shipowners, and something more. They did not, as a rule, carry freight for others. When Mr. Derby or Mr. Gray or Mr. Peabody built a ship he calculated to use it in his own mercantile ventures. He would furnish it with an outward freight, and the sale of this procured a homeward cargo, which the merchant would dispose of from his own warehouses. Mr. Derby owned about forty vessels, and the largest of them made forty-five voyages for him to India and China. Most of his enterprises were very successful."

The ships operated by Derby and the other merchant traders of his day were small sailing vessels of 300 tons and less. Such vessels could readily be built and fitted out with crew and cargo, by an individual or group of men with but a small amount of capital, who would have been unable to own and operate a number of vessels and to engage in the carrying service as distinct from the business of a trader. As the foreign trade of the United States and the passenger traffic between Europe and America be-

came large and of fairly constant volume ocean transportation came to be a business increasingly distinct from the business of the merchant or trader, and lines of sailing vessels were put into service by companies whose sole business was the ownership and operation of ships.

According to Marvin, the first line of sailing vessels was the Black Ball Line, which began running between New York and Liverpool in 1816. He states that "in 1822 a second line to Liverpool was founded; in the next year a third line to Hull." The ships of these "packet" lines, as they were called, were larger than the ordinary merchant vessel of their time; they had regular sailing dates; they carried the mails, the cargoes of highest value, and the steerage and cabin passenger traffic. These early packet ships were stanch vessels, constructed for safety and economy rather than speed. The demand for speed came later, and was met by the lines of clipper sailing vessels and by the steamship lines.

The lines of sailing "packets" and clippers were gradually superseded after 1850 by the steamship lines. For the United States this meant a decline in the tonnage of our registered shipping; for Great Britain it meant a rapid expansion of her merchant marine; for the ocean transportation service generally it was the beginning of a rapid development. The first effect of steam was to increase the speed and regularity of ocean transportation, and thus to cause a rapid growth in the traffic for which lines of vessels—as contrasted with the chartered ship without a fixed route and a definite schedule—are best adapted, viz., passengers, mail and express, package freight, or general cargo, and perishable commodities.

The second effect of steam was to increase the shipments of bulky cargoes that do not require rapid transit but must be moved cheaply, and must be delivered at the time agreed upon by the consignor and consignee. This

service is one for which the chartered steamer is best adapted; and the great expansion in the tonnage of bulky goods, and of the materials of industry, has been caused in large measure by the "tramp" steamer. When the flow of bulky traffic becomes regular and of large volume the line steamers share the business with the chartered vessel, but not to its exclusion.

The evolution of the ocean transportation service during the past century may be summarized with reference to American trade as follows: During the early decades of the last century the volume of our foreign trade became large enough to cause individuals, and companies who were not merchants or traders, to engage largely in the carrying trade. The ocean transportation service became a distinct business. Two kinds of service then came to be differentiated: line traffic and charter traffic. The introduction of steam followed, and the traffic handled by line vessels was able to expand with great rapidity. In course of time—approximately by 1870—the technical improvement of the marine engine, and the growth in the size of ocean vessels, so reduced the cost of moving bulky traffic by steam power as to make the tramp steamer an economical carrier of cargo freight. Charter traffic could be handled both by steamers and sailing vessels; it increased rapidly in volume, and has tended steadily to pass from the sailing vessel to the steamer. Lastly, there is now discernible a tendency for line steamers to share more and more in the traffic that formerly was handled by chartered vessels. This is the result of the growing volume and regularity of international exchanges, of the ability of the line steamers to take freight at lower rates than were formerly possible, and of the increasing value of doing business rapidly. Electric communication between all parts of the world and perfected international banking facilities are causing international trade to be handled

more and more expeditiously. Time is money to an increasing extent even in the bulky traffic of ocean commerce.

The progress of ocean transportation during the past sixty years and the working out of an economical organization for handling the traffic for which steamship lines are best adapted have had two general results. The small steamship company operating four or five small vessels over a single route has grown to be a company owning scores of ships, with an aggregate tonnage of from 100,000 to several hundred thousands, and engaged in traffic over numerous ocean routes. These great companies, furthermore, have found their competition with each other increasingly severe, and they have been forced to seek to control their interrelations by associated action and traffic agreements, or by the amalgamation of competing companies by means of purchase and sale. As in industry so in transportation, both by railway and on the ocean, steam power has revolutionized business methods and compelled the substitution of organization and associated effort for the unorganized struggle of competitive individual activity.

The extent to which organization and coördination have been worked out in the ocean transportation service by the building up of great lines may be illustrated by referring to the Hamburg-American Packet Company, which started business with a few sailing vessels in 1847; nine years later steamers were added to the service; in 1893 the company was operating 99 vessels of all descriptions, with an aggregate tonnage of over 200,000 tons. The fleet of this company in 1905 comprised 324 vessels, with a total tonnage of 736,108. This included 140 ocean steamships, with a total tonnage of 695,356 tons gross. The company maintains a service to Canada, to the West Indies, to the west coast of South America, to China, Japan, Australia, and to Africa. The North German Lloyd, which started

in 1857 with three steamers, had in 1903 a fleet of 315 vessels, with a tonnage of 587,070, in which there were included 74 ocean steamers, with a tonnage of 476,205. The Cunard Company started in 1840, and had in 1901 a fleet of 24 vessels, aggregating 114,410 tons. This, however, is not the largest British Company; the British India Company had 117 ships, of 361,695 tons, in 1901; and the Peninsula and Oriental Company 57 ships, of 320,351 tons.

These great companies have been built up partly by internal growth and partly by buying up the lines operated by other companies. The most conspicuous instance of the combination of lines was the formation of the International Mercantile Marine Company, which in 1902 brought under one ownership and management five large transatlantic lines, whose aggregate fleet comprised 136 vessels, with a tonnage of 1,034,884. The lines brought together were the Leyland Line, the White Star, the International Navigation Company, the Atlantic Transport, and the Dominion Line. In forming this merger, Mr. J. P. Morgan and his associates sought to include the powerful Cunard Company, and the two great German companies, the Hamburg-American and the North German Lloyd; but the Cunard Company was given a largely increased subsidy by the British Government to remain an independent British company, and the two German lines were under contract with their Government not to sell out to a foreign company. The German lines, however, entered into an agreement with the International Mercantile Marine Company whereby a territorial division of traffic was effected, and the main results of consolidation were secured.

The economy of doing business on a large scale accounts for the growth of the great steamship companies. The merger of these companies into a mammoth organization, such as the International Mercantile Marine Com-

pany, is prompted not only by the greater economy of management, but also by the necessity of regulating competition, which, if left unrestrained, will, as experience has shown, destroy profits and prevent the successful development of the service. Competition in the ocean transportation business is widespread and keen; and as the rival companies become larger and more powerful the forces of competition become increasingly intense, and some method of regulating the interrelations becomes a necessity. Hence, we find that the growth in size of the steamship companies, and the development of a higher organization of the service they perform, is accompanied by an increasing effort to regulate their competitive interrelations. The truth of this general principle will become evident upon an analysis of the nature and scope of competition in the ocean transportation service. Such an analysis is essayed in the following chapter.

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# CHAPTER X

## MONOPOLY AND COMPETITION IN THE OCEAN TRANSPORTATION SERVICE

A business or a service may be competitive or monopolistic, or it may be in part monopolistic and in part subject to competition. A monopoly may be complete or partial. Complete monopoly is the absence of all competition as regards the fixing of prices. The essence of monopoly is the power to decide what price the purchaser shall pay; and the degree of monopoly possessed by a producer or a carrier is determined by the measure of his ability to fix the charge.

In discussing monopoly and competition, the author states, in his volume on "American Railway Transportation," that "in a certain sense the producer (or carrier) never has the sole power to fix the price, even though he may be the only person from whom the commodity or service in his control can be secured, because he must always consult the nature of the purchasers' wants and their ability to pay. If the possessor of a monopoly charges more than any buyer is willing to pay, no sales will be made; if the prices are fixed higher than any considerable percentage of possible buyers can afford to give, the market will be largely restricted. This is equivalent to saying that the consumers or users are the ones who fix the limit beyond which charges cannot go; but if all, or the larger share, of the supply required by purchasers can be obtained only from one person or combination of producers, those who

sell can compel those who buy to pay all they are willing to give rather than go without the commodity or service desired. The price fixed under such conditions is a monopoly price pure and simple. Those who sell, charge what they think will yield them the maximum profits on their total business."

If purchasers can compel those who have commodities or services to sell to accept the lowest price which they will take rather than not make a sale, the business or service is one in which there is free competition; if the producer or carrier can compel the buyer to pay all he will give rather than forego having the article or service he desires, there is complete monopoly. If neither of the parties to the transaction, the producer and the consumer, the carrier and the shipper, can compel the other to accept the least favorable terms, there is neither free competition nor complete monopoly. If the carrier cannot compel the shipper or traveler to pay all he would be willing to pay rather than go without the service; or, stated otherwise, if the buyer of the service can compel the carrier to charge less than the maximum value of the service to the buyer, the rate or fare is partly competitive and partly monopolistic. The carrier possesses a partial monopoly.

The service of ocean transportation is highly competitive, much more so than the business of railway transportation. There are several reasons why this is true:

1. The ocean is a highway free to all persons. Not only may every vessel sail the sea at will; it may also enter the ports of every country to load and unload cargo. A small charge may be made for the privilege of entering the port and using its facilities, but the rate of charges is the same for everybody. Even at ports where the commercial facilities have been provided by the capital of a private company, the right of shippers and carriers generally to use those facilities is carefully maintained by

public regulation. The ownership of a port may be—although it usually is not—private, but its use is public.

2. A ship may start from any port and reach any other port in any sea. The ocean vessel has a far greater range of movement than has the railroad train. The entire sea, all its routes and their termini, are available for the ship. There is no chance "to divide the field" of traffic operations at sea, and restrict the business of certain ocean routes and termini to a single carrier or combination of carriers. The competition of the independent vessel may and does, like the tides, reach every shore.

3. Any person may easily engage in ocean transportation. The minimum amount of capital required to enter upon the business is small. There are small ships as well as large ones that may be purchased or hired by anyone desiring to become a public carrier, or by a manufacturer or trader who may desire to make but a single shipment. A vessel may be chartered as readily as a house may be rented. In each large port there are ship brokers in cable connection with other large ports, and thus informed regarding ships in all parts of the world. At all times there are many vessels desiring cargo, and the ship broker can usually give the shipper or would-be charterer a choice of several ships. The exporter of locomotives or bridges from Philadelphia, of wheat from Chicago, or of cotton from New Orleans, may either engage some existing carrier to handle the traffic, or, if the rates charged seem unreasonably high, he may charter a vessel either for a single trip, or for such time as he may wish, and thus transport his own goods.

4. One may retire from the field of ocean transportation as easily as he may enter it. Although property in a ship is "fixed capital," in that the ship can be used only for the one service of transportation, the ownership of this fixed capital may readily change hands. The ship

represents a relatively small amount of capital, as compared with a railroad, for example, and under ordinary conditions a buyer may readily be found. At least there will be little difficulty in finding a person who will charter a freight vessel.

These four points indicate the main differences between the railway and ocean transportation services. The railroad company operates over a well-defined territory from which other rail carriers are excluded. The roadway, terminal facilities, and equipment represent a large investment of fixed capital, which cannot readily be sold or leased. The owners of vessels, on the contrary, are not restricted to any territory, nor can they prevent any other owner from entering the field they may select for their traffic operations. The only fixed capital the ocean carrier ordinarily need have is in his floating equipment; nature provides the roadway, and the public usually dredges the harbor channels and basins.

Property in vessels can ordinarily be sold or leased readily. A freight vessel is more easily sold or chartered than an express passenger steamer; but even for the latter there can usually be found some individual or company who will buy or lease, although the owner may be obliged to sell at a sacrifice, or may be compelled to refit the ship for the freight service before he can dispose of the property.

The large ocean carrier who is operating one or several lines comprising numerous vessels, may find it advantageous to construct terminal facilities; but, in most cases, the central or local government, some public "trust," or some dock company, constructs and manages the docks and wharves, and leases to the large lines such facilities as they may require. Even the largest steamship companies have secured exclusive possession of neither the terminals nor the routes of any portion of the ocean transportation field,

although for certain routes, and for the passenger service and the mail and express business, the traffic position of certain powerful lines is now so strong that outside competition has become difficult for the line business they handle. Efforts are now being made by the great steamship companies to restrain competition, and even to divide among themselves the line traffic over certain routes by confining the traffic operations of each company or associated group of companies to a definite territory. The manner in which they have attempted to do this, the difficulties they have encountered, and the success they have had, will be explained in the following chapter.

The difference between line traffic and charter traffic needs to be kept clearly in mind in analyzing the nature of competition in the ocean transportation service. In charter traffic competition is full and free, and must always be so. There is no possibility of monopolizing the service of transporting upon the ocean the great staple articles of international and coastwise commerce. As long as the ports of the world are open on equal terms to all shippers and carriers, as long as men may buy or charter vessels and sail them at will upon the high seas, the rates charged for the ocean transportation of the great staples of industry and trade, and hence for the larger share of the tonnage of ocean freight, will be competitive.

In line traffic competition may be restricted to some extent. To establish a line of large fast steamers, each of 10,000 to 20,000 tons gross register, capable of maintaining a speed of from 15 to 22 knots, having weekly or more frequent sailings from each side of the Atlantic or Pacific; in other words, to fulfill the requirements that must be met in the present-day passenger and mail services, means the investment of several millions of dollars, and the organization of a business that only a large corporation can undertake. In such a business the number of

competitors will be limited, and if the small number of rivals can come to an agreement as to rates, division of traffic, or pooling of earnings, competition can be regulated and some measure of monopoly can be established.

The competition among powerful ocean steamship lines for the transportation of passengers, mails, and express freight is similar to the competition of rival railway systems. In each case there is a powerful incentive to hold traffic against competitors, and to add steadily to the volume of business. Until the point of maximum traffic is reached, more passengers and more freight mean more than a proportionate increase in profits. "The law of increasing returns" obtains in the transportation business on the ocean as well as on the land.

The competition among great steamship lines is inevitably intense. Each corporation has an enormous investment at stake, and while its ships can be transferred to some other ocean route and to some other service, the vessels, having been constructed and equipped with special reference to the particular service they are performing, cannot be sold or transferred to some other route without large financial loss.

At the same time the prize to be gained by successful competition is a large one. To be able to secure and hold against rivals the steadily increasing cabin and steerage passenger traffic, the contracts for carrying the mails, and the business of handling express and fast freight over any one of several of the more important routes across the Atlantic or Pacific, or between Europe and the Orient, is to obtain possession of a large business containing the prospect of becoming increasingly profitable with the natural growth in the population and trade of the countries connected.

The struggles of such giants for prizes so great are apt to be financially destructive for both or all combatants.

Like the traffic wars of powerful railroad companies, the competition of great steamship companies becomes so severe as to cease to be a healthy stimulus to business, artificial and unstable conditions of trade are created, and at the close of the struggle the carriers find themselves financially weak, and less able than they were at the beginning of their traffic war to improve their service and to keep their equipment and facilities abreast of business needs.

As with rival railroads, so with competing steamship companies, coöperation for the regulation of competition is necessary.[1] This is shown clearly by the history of the interrelations of steamship companies, by the rate and traffic agreements and pooling arrangements they have made, by the merging of small companies into larger ones, and by the consolidation of several large companies into

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[1] The thought that unbridled competition is beneficial neither in industry nor in transportation, and is detrimental to the public as well as to the carrier, was eloquently expressed by the Hon. Martin A. Knapp, Chairman of the Interstate Commerce Commission, in an address on "The Social Effects of Transportation," delivered before the American Academy of Political and Social Science in 1902. "When population was scattered and sparse, when movement was difficult and costly, when communities were isolated by distance and by dissimilarity, and bonds of relationship were feeble and few, the attrition of rivalry was complacently endured. But now, when seas are spanned with steamships and netted with electric wires; when city and forest, farm and factory, mine and countingroom, are joined together by innumerable pathways of steel, and the swift locomotive, rushing across continents, like the shuttle through the loom, weaves this majestic fabric of commerce which covers the globe; when life is no longer localized in effort or achievement, and the thought of one man is the instantaneous possession of all men, the friction of unbridled competition has become irksome and intolerable. It is folly to shut our eyes to unmistakable facts, or to stand in the way of inevitable events. Doubters may deride, demagogues denounce, and ignorant lawmakers strive to build up legal barriers; but neither agitation, nor protestation, nor legislation can stop the growth or prevent the advance of industrial federation." (*Annals of the American Academy of Political and Social Science*, July, 1902, vol. xx, p. 14.)

a yet more powerful corporation. Before taking up the question of rates it will be well to study the history of the interrelations of ocean carriers.

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# CHAPTER XI

## RATE AND TRAFFIC AGREEMENTS, POOLS, AND CONSOLIDATIONS OF OCEAN CARRIERS

A LARGE measure of coöperation among ocean carriers is necessary for them, and may be of advantage to shippers. The competition of steamship lines with each other is so intense, and, unless restrained by some agreement among the carriers, is so persistent, that the successful and profitable management of the ocean transportation business under existing conditions practically requires the steamship lines to enter into arrangements regulating their interrelations.

The agreements required to regulate the competitive relations of ocean carriers necessarily include many details. It is the purpose of this chapter to state the main provisions contained in these agreements, and to consider briefly the results that have been accomplished by the coöperation of ocean lines.

Although the chief purpose of coöperation among ocean carriers is to restrain competition, their rate and traffic agreements, and the pools they form may be a benefit to shippers. The merchant engaged in international trade desires an adequate service at rates that are reasonable and fairly stable; fluctuating rates seriously interfere with trade, whether it be domestic or international. Sudden and large changes, often characteristic of ocean rates, may interfere with the development of commerce as seriously as the unstable competitive rates by

rail in the United States have in times past hampered the industrial development of different sections of our country. Mr. Ellerman, chairman of the Ellerman Lines, speaking at an annual meeting of that company a few years ago, stated that " shippers and merchants, as a body, commonly prefer a basis of trade common to all shippers, on which they are enabled with confidence to conduct their calculations as to the prices at which they can land goods at any given point. Merchants are thereby enabled to conduct their business without the risk of serious fluctuations in freight from week to week, and they also have the knowledge that all merchants are paying the same rates of freight."

From the shipper's point of view, the advantages of coöperation on the part of the steamship lines are that coöperation gives a more regular service, a better adjustment of schedules of sailings, and greater stability in rates. These benefits to the shipper, however, may be largely nullified by the steamship companies, if they follow a policy of restricting the development of the service, and a policy of high fares and small volume of business instead of low fares and maximum traffic. Instances are not wanting of arbitrary action on the part of the steamship organizations to prevent outside lines from interfering with the established traffic of the associated companies, and shippers are often penalized for patronizing lines not belonging to the combination. The tendency of those possessing exclusive privileges is to seek vigorously to retain such privileges against outside interference; accordingly, it may well happen that combinations among ocean carriers, which seem to be rendered necessary by the severity of unrestricted competition, should be regulated by adequate legislation and be carefully supervised by governmental authority.

The name " Conference " is given to associations of

ocean lines. The lines from Europe or the United States to each important section of the world usually unite in a conference. There is, for example, a South African Conference, a China Conference, and an Australian Conference of the European lines, and others for East South America, West South America, etc. Sometimes the lines from the United States are members of a European conference, and sometimes the American lines have separate associations.

The vessel lines forming a conference enter more or less formally into agreements regarding the number of vessels each line shall operate, the days of sailing, the classification of freight, and freight rates. Sometimes these agreements provide for a division of the traffic field; in some instances a division of the traffic within a common field is provided for; and frequently provisions are made for pooling the earnings of the several lines and dividing the joint earnings according to stipulated ratios. With the exception of the pooling contracts, the agreements entered into by lines forming a conference are more in the nature of "gentlemen's agreements" than of legally enforcible contracts. The agreements are usually for one year, and, as will be shown later, are usually unstable, requiring frequent amendments and readjustments.

The system prevails of giving rebates from the freight charges, usually ten per cent, to those shippers who patronize only the vessels belonging to the members of the conference. Shippers who patronize outside lines are compelled to pay the full rates without subsequent rebate. The funds required to pay the small expense of administering the conference are secured by levying upon the members of the association, each line paying in proportion to the amount of business it handles.

These conferences of ocean carriers have different

forms of organization and different purposes. The following types are distinguishable:

1. Representatives of the steamship lines operating from any one port may confer more or less frequently in regard to dates of sailing, frequency of service, classification of traffic and rates, and other matters of mutual interest. These conferences may be without formal organization, and be only for the purpose of reaching a common understanding as to the interrelations of the competitive carriers, with the hope that business arrangements satisfactory to all parties concerned may be decided upon.

2. The conference may have a more formal organization, with a secretary and other officers elected to supervise and regulate the business arrangements entered into by the members of the association. A good example of this more permanent type of organization is the North Atlantic Steam Traffic Conference, which has had a more or less continuous existence for many years. It has attempted to regulate the freight business of the conference lines by deciding upon the number of the ships each line should operate, and the terminal services that should be rendered by vessel owners, and it has also sought as far as possible to regulate freight rates. Rates, however, are so highly competitive in the North Atlantic service that the traffic conference has succeeded only in a slight degree in deciding upon an enforcible schedule of charges.

The most systematic effort made by the Conference to control freight rates was the attempt made in 1902, when its members entered into the "minimum freight agreement," whereby each line pledged itself to charge not less than stipulated rates for the relatively limited number of articles enumerated in the compact. By this agreement an effort was made to put an end to the demoralization in freight rates that occurred in 1902, when the shipping facilities were so much in excess of the de-

mand for ships that ocean rates generally went to a ruinously low figure. For about two years this minimum freight agreement was fairly successful in preventing serious cutting of rates upon a limited class of goods. A sincere effort was made on the part of the companies in the conference to accomplish the regulation of freight rates, and the fact that this agreement was only partially successful, and lasted for only two years, indicates the difficulty of regulating competition among ocean carriers.

Another important conference similar to the one for the North Atlantic steam traffic is the International Conference of Shipowners Engaged in the Baltic and White Sea Trades. This association has met annually from 1890 to the present time, and, as its title suggests, it comprises the principal shipowners engaged in the Baltic and White Sea trades. The conference in 1905 met at Copenhagen, February 16, 17, 18, at which time a minimum schedule of rates adjusted for various ports is reported to have been adopted.[1] As there are numerous individual vessels and lines of ships outside of the conference, there is little certainty as to the ability of the members of the organization to enforce the scale of rates agreed upon. Whether they succeed in doing so will depend upon the ratio of shipping facilities to freight. If the relatively active demand for shipping that prevailed at the time of the adoption of the scale of rates should continue it will probably be possible to maintain conference rates, otherwise not.

3. As a third type of organization may be mentioned The Sailing Shipowners International Union, organized December, 1903, for the object of fixing minimum rates of freight for the principal voyages in which sailing vessels are engaged in bringing freight to European ports from countries outside of Europe. A permanent com-

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[1] See *Fairplay*, March 16, 1905, p. 438.

mittee is authorized by the union to fix these freight rates from time to time for the various leading foreign ports. In joining the union each member promises to abide by all rates fixed by the union, and not to grant any rebates or commissions. He also agrees to let his ship lie by or sail in ballast if cargo cannot be secured at union rates. The agreement applies only to sailing vessels of one thousand tons or more burden; the membership is for one year; and three months' notice must be given of intention to withdraw from the union. To defray the expense of administering the union each member is required to contribute £1 per annum for each vessel entered. At the second annual meeting of the union, held in Paris, December, 1904, favorable reports were given as to the operation of the agreement. It was said that three fourths of the seagoing sail tonnage available for membership had become identified with the union. The future of this organization may be watched with interest. The task it has undertaken is so difficult that, if it should succeed in accomplishing its purpose, and should continue in existence for a number of years, its success would indicate that much progress has been made in the ability to limit competition in the ocean transportation service.

4. The Chamber of Shipping of the United Kingdom is a general organization of those engaged in the ocean transportation business from the ports of that country. This association corresponds to a chamber of commerce, and is concerned with general questions of shipping policy rather than with the regulation of competition among shipping lines. Its offices are in London.

A study of the main provisions of the agreements entered into by the steamship lines in their "conferences" will indicate the purpose and scope of these organizations. The agreements are not the same for every conference, the plan of organization being broader in some instances

than in others. The provisions discussed below are to be taken as covering the conferences as a whole, rather than the contracts entered into by the constituent lines of any particular organization.

1. The most important agreement is in regard to rates that shall be charged by the lines that are members of the conference. The chief purpose of joint action is to prevent competition from forcing rates below a profitable level. The agreement may provide either that the several companies shall charge the same rates, or that they shall not charge less than stipulated minimum rates. The enforcement of the agreement is difficult, and frequent revisions of the terms are usually necessary. Sometimes compliance with the agreement is secured by pooling the receipts from the competitive traffic; more often, however, the observance of the contract is enforced by the understanding that any company violating the agreement will have to contend against the united opposition of all the other members of the conference.

2. The rates agreed upon by the conference are in part based upon a rough classification of the freight carried by the constituent companies. The variety of the articles transported even by the largest steamship company is much less than the number handled by the ordinary railroad company, and the classification of ocean freight is much less complete than that of rail traffic. Indeed, the tonnage of the exports from the United States to Europe consists so largely of a few bulky commodities, and to so small an extent of general manufactures other than heavy mineral products, that the classification of the articles included in our exports to Europe is not general.

The steamship lines from northern Europe carry a large variety of commodities, and the classification of their freight has been worked out more fully than have the exports from the United States to Europe. The lines

from Bremen to New York and Baltimore, for instance, divide the freight they carry into five general classes, each class having its own rate; the freight from Bremen to New Orleans, comprising a smaller number of articles, is grouped into two classes; the traffic from Rotterdam to South Africa is divided into four classes, and that from Rotterdam to the Dutch East Indies into five classes. One of the interesting ocean freight classifications is that adopted a few years since by the Royal Mail Steam Packet Company for its business from Great Britain to the Pacific ports of Central America and Mexico. The long list of articles is grouped under the seven following heads: "valuable," "fine," "coarse," "common," "rough," "special," and "iron." As is the case with railroad freight, the ocean lines carry a large tonnage of unclassified articles.

There is less necessity for detailed classification of ocean freight than of rail freight; the competition is more active, changes in rates are more frequent, and consequently the conditions are far less favorable for classification. The tendency, however, for the companies operating from Europe to New York and to South Africa is to work under a common classification; for those to South America to have a classification adapted to that traffic; and the same is true of the lines to Australia and to the Orient. In only a few instances are these classifications permanent enough to warrant their being printed; more often they are distributed in typewritten form among the companies interested in them.

The following interesting comparison of freight classification in the railway business and the ocean freight service is taken from a letter received by the author from William H. Avery, general agent, Toyo Kisen Kaisha (Oriental Steamship Company): "The common tariffs for ocean freight would not answer the same purposes as the

classifications and tariffs of our domestic railroads; their classifications and tariffs on the various articles of freight being based on the volume of certain commodities moving between given points as well as upon the manner in which they are shipped, whether completely boxed or crated, whether set up or K.D. [knocked down], or shipped in baskets or bundles, etc. As the number of different articles offered for transportation to our railroads greatly exceeds those shipped to foreign countries, and as the methods of preparing the articles for shipment differ, it is necessary that they be classified separately, in order to apply the proper freight charges on them. This may be illustrated by referring to the classification of articles of crockery and earthenware as shown in the current edition of the 'Western Railroad Classification.' These are rated as follows in less than carload quantities:

| | |
|---|---|
| In barrels, boxes, or kegs | second class |
| In stave baskets with light wood covers | second " |
| In barrels with cloth tops | first " |
| In ordinary crockery crates or casks | third " |
| In circular slatted crates bound with wire or wooden hoops | second " |

While in carloads of 24,000 pounds they can be shipped in any of the above packages at a fifth-class rate.

"The same goods, except where they form a staple article of trade between two foreign countries, in which case special rates are provided, are taken as general merchandise, at so much per ton, weight or measurement, ship's option (usually 2,000 pounds, or forty cubic feet, being considered a ton); in other words, if the shipment measures thirty cubic feet and weighs only 1,000 pounds, freight is assessed on the measurement basis, and *vice versa*. The manner and the methods of packing goods for ocean transportation do not enter into the subject of ocean rates so extensively as they do in railroad traffic,

for the reason that goods are invariably prepared for shipment with the view to a long voyage and more severe handling."

3. An essential feature of the agreement among the members of the conference is that of granting a rebate —usually of ten per cent—from the freight charges to those shippers who patronize only the vessels belonging to the conference lines. The rebates are sometimes calculated each six months, and are made payable six months after the calculation is made; in other instances the rebates are reckoned at the end of each year, and are payable six months thereafter. According to Sir Donald Currie, the chairman of the Union-Castle Mail Steamship Company, " this so-called rebate system prevails in every ocean steam trade, and while providing the necessary support which steamers (to be regularly employed) really require, it secures, under suitable arrangements with the merchants, regularity of rates, as well as the supply of sufficient steam tonnage."

The editor of *Fairplay* is also of the opinion that the rebate system is useful and necessary. He states that " the rebate system has been found of great service in all shipping trades," because it " prevents the cutting of rates, and is to that extent as much a protection to the shippers as to the ' ring ' " (conference).

Besides granting rebates to shippers who patronize only the conference lines, the association guarantees that shippers shall have the advantage of regular sailings, of an adequate supply of tonnage, and that they shall all be charged equal rates for equal services. The conference lines further agree to protect their shippers against the competition of outside merchants by meeting the ocean freight rates secured by the competing merchants from carriers not belonging to the conference. These guarantees may unquestionably be of great value to the shippers,

and they go far to explain the slight and infrequent opposition that shippers show to combinations among ocean carriers.

4. Another provision frequently included in the agreement entered into by the members of the conference is one providing for a division of the traffic. This is sometimes accomplished by a territorial division of the business, each line being given the right to handle the traffic of certain designated ports. When the territorial division of traffic is not practicable it is frequently possible for several lines operating from the same port or ports to divide the traffic of their common territory.

A good instance of the territorial division of traffic is that made in 1902 by the Booth Line, the Hamburg-American Packet Company, and the South American Steam Navigation Company. It was agreed among these three lines that the British company should cease to run vessels between Hamburg and north Brazil, and that the German lines should withdraw the vessels they were running from New York and Liverpool to points in north Brazil.

In 1902, Barber and Company, of New York, and the General Transatlantic Company of France, made an agreement which provided that the vessels of the French company should be operated between Havre and American ports, and that the steamers belonging to the New York firm should make Bordeaux and Dunkirk their French ports.

One of the best examples of territorial division of traffic is that afforded by the agreement between the International Mercantile Marine Company and the German lines. One of the provisions of that agreement was that the vessels of the International Mercantile Marine Company should not interfere with the traffic of the German lines in German ports; an understanding was also reached

as to the British ports at which the German lines should call on their trips to and from the United States.

A division of traffic among the lines doing business at the same ports or within the same traffic territory is frequently made. A good illustration of this kind of an agreement is the one entered into by two British companies—the Peninsular and Oriental Line and the British India Line—and the German company operating the Hansa Line. This agreement, made in 1893, stipulated that the British lines should handle the traffic to India from Middleborough and London, and should not interfere with the traffic of the Hansa Line at Hamburg and Antwerp. In 1898 this agreement was so modified that the British lines were each to be permitted to have six sailings per year from Antwerp to Madras, and six sailings from Antwerp to Bombay and Karachi, provided that the Hansa company was not able to handle this traffic. The agreement also stipulated the quantity of cargo that might be taken upon any voyage. This agreement lasted until June 30, 1905, when the Peninsular and Oriental Company withdrew, in order to enter more largely into the traffic from Antwerp.

A division of traffic within the same territory was arranged for in 1905 in a slightly different manner by two French lines, whereby it was agreed that they would, after August 1, 1905, conduct their services to Indo-China, China, and Japan by alternate sailings from British ports, in order thereby to divide the traffic between the vessels of the two lines. An agreement similar to this was entered into in 1902 by the Prince Line and the Houston Line. The two companies decided to unite in performing a service by alternate fortnightly sailings from New York to Capetown, Port Natal, and Delagoa Bay.

5. The agreement entered into by rival ocean carriers

occasionally provides for the pooling of the profits of the competitive business. The pooling contracts of ocean carriers are similar to those existing in the railway business in the United States before 1887. The establishment and maintenance of a pool among ocean carriers presents exceptional difficulties, because of the strength of competition in the ocean transportation service, and because of the frequent changes in the conditions affecting the service. The consequence is that ocean pools cover only a small portion of the competitive business of carriers, and such pools as are formed do not usually have a long life.

A typical pool in the ocean transportation business was that established by the Hamburg-American and the Hamburg-South American companies in December, 1900, at which time it was agreed that the Hamburg-American Company was to receive one third and the Hamburg-South American Company two thirds of the profits of the business handled by the two companies between Hamburg and the east coast of South America.

An agreement entered into in September, 1904, between the Austrian Lloyd Company and the Puglia Steam Navigation Company (an Italian company), provided that the Lloyd line should receive three fifths and the Italian line two fifths of the competitive business of the two companies.

As another instance of a pooling arrangement mention may be made of the agreement which existed for some years previous to 1905 between the Cunard Steamship Company and the White Star Line, which two companies shared equally the earnings received for carrying the mails west-bound from the United Kingdom. This pooling arrangement terminated in 1905, at which time the Cunard Company refused to coöperate in the future with the White Star Line in providing the British Gov-

ernment with a joint mail service based upon a pool of the earnings therefrom.

A large and important pooling arrangement was entered into in 1901 by numerous steamship lines operating vessels between the United Kingdom and South Africa. This pool provided for common rates, and a division of the business according to agreed ratios. The pool was in successful operation until the latter part of 1903, when the competition of the outside lines led to the termination of the agreement. The difficulty of administering a large pooling arrangement such as this is indicated by the fact that during the year 1902 there were eighty-seven meetings of the representatives of the pooled lines, and in 1903 sixty-one meetings up to August, after which no conferences were held.

Workable and effective agreements among rival ocean carriers are difficult to make and more difficult to maintain. The all-pervading influence of competition not only between two or more lines, but between line vessels and those operated individually or under charters, presents a situation which ocean carriers have been able only partially to control by means of their agreements regarding rates, services, and divisions of traffic or profits.

The difficulty of bringing the ocean traffic of any large section under the control of a single conference of interested carriers is well illustrated by the North Atlantic steerage passenger traffic. This traffic, it would seem, might readily be controlled. The emigrant business from Europe is handled through a comparatively small number of ports, and the number of lines equipped for the steerage business is limited. Nevertheless, the traffic is so profitable that some lines will always refuse to restrict the management of their business by becoming members of a conference. For a few years previous to 1903 the North Atlantic steerage business had been under fair con-

trol, but the outside lines, such as the Beaver Line, the Atlantic service of the Canadian Pacific, and especially the Danish Line, created conditions so unfavorable to some of the lines within the conference, that the Cunard Line felt obliged to withdraw from its agreement with the other members of the conference. A most severe traffic war to secure the North American steerage business raged through the larger part of 1903–04.

The conference agreements of ocean carriers are unstable, partly because the profits to be derived temporarily by any individual line that may cut the rates, while others maintain them, are large. During times of exceptional prosperity, when there is business enough to employ the facilities of all the companies, there is little temptation to deviate from conference agreements; but when traffic becomes scarce and profits rapidly decline the temptation to secure a temporary advantage by obtaining traffic at cut rates becomes stronger than many vessel owners are able to withstand.

Another reason why agreements among ocean carriers are difficult to maintain is, that it is to the interests of shipbuilders to construct and place upon the market as great a tonnage as possible. There is a constant tendency toward oversupply of ocean shipping. During times of prosperity, when there is a demand for a large tonnage, shipbuilding expands rapidly and the activity of the builders continues beyond the period of prosperity, and thus tends to create an oversupply of shipping during periods when business is not abnormally active.

International rivalries and jealousies in the shipping world also work against the stability of agreements among ocean carriers. The shipping interests of each country are impelled by business and patriotic motives to develop the shipping of their country in preference to that belonging to the people of other nationalities. This spirit is

strengthened by the support given by many countries to the shipping interests of their own people. As the editor of *Fairplay* remarks, "the uncertainty of the foreign factor has been one of the chief obstacles in the way of combination among British shipowners." What is true of British shipowners is equally true of those of other countries.

The instability of the agreements among ocean carriers affords the shippers and the traveling public a safeguard against extortionate charges. If the conference lines attempt to enforce high rates, the competition of outside carriers will soon disrupt the agreement, even if the lines within the conference should refrain from cutting rates. With the exception of short periods of unusual business prosperity, the rates adopted by the conference must be fixed at a point low enough to cause rate cutting to yield but slight profits, or no gain, to the carrier that violates the rate agreement.

While agreements among ocean carriers are unstable in all parts of the world, they are less unstable in Europe than in the United States. In Europe, the vessels operated as lines are generally owned by the companies operating them; whereas in the United States the companies operating lines frequently own but a part of the ships they control, and charter or lease such other vessels as they require. European steamship companies have great property interests at stake, and are more disposed to adhere to conference agreements than are the American companies. Most of the European agreements were able to outlive the period of depression following the Boer War, whereas most of the American combinations went to pieces.

The older and more highly organized the ocean transportation service of a country becomes, the greater the stability of the service; accordingly, we may expect to

see the ocean transportation business performed by American companies gradually brought under a more perfect organization characterized by a higher degree of coöperation among rival interests. This greater coöperation in the ocean transportation services will be of advantage both to the carriers and the public.

### REFERENCES FOR FURTHER READING

"Highways of Commerce." Special Consular Reports, vol. xii, 1899, Washington, D. C. (This volume contains some information of value regarding the classification of ocean freight).

There is practically no literature upon the subject of agreements and combinations among ocean carriers. The material upon which this chapter is based was gathered mainly from the files of such shipping journals as *Fairplay* and *Lloyd's Gazette*, published in London, and the *Journal of Commerce*, published in New York. The author desires to acknowledge his indebtedness to Dr. J. Russell Smith, of the University of Pennsylvania, from whose notes much of the information presented in this chapter was obtained.

# CHAPTER XII

## COÖPERATION AND COMBINATION OF OCEAN AND RAIL CARRIERS

The constant interchange of a large volume of traffic compels ocean and rail carriers to coöperate. The cheapening in cost of transportation during recent decades has enormously increased the tonnage of international commerce. The markets for even heavy commodities have become world-wide, and the organization of trade upon the basis of a world market renders more and more necessary a close coördination of the services of rail and water carriers.

Moreover, constant efforts to economize in the expenses of transportation are bringing about an increased unity in the organization of the service of public carriers. Indeed, in the more recently developed international transportation services, the tendency is distinctly toward a single management for the performance of the entire service of connecting the producers of one country with the consumers residing in another country. There are limits to the development of this tendency toward unifying the control of rail and water transportation, and it is not at all certain that both services shall everywhere come under a common management; but there is no doubt that the coördination of rail and water transportation will become increasingly close with the higher organization of the transportation business.

Whether the shipper conducts his business at the sea-

board or at some remote interior point, he is now able to ship, on through bills of lading, by rail and water carriers, direct to the foreign destination. Facilities for such through shipments are now provided by most railroad companies. There are also freight forwarders and exporters and importers not connected with the railroad companies, and not necessarily connected with any line of steamships, who not only solicit freight from producers for shipment abroad, but also facilitate the importation of goods produced in foreign countries. For these services the freight forwarder charges the shippers or buyers a small commission. Oftentimes the freight forwarder operates a line of vessels which he may own or charter, and then his services consist of securing traffic from many interior and seaboard points for shipment abroad by his own line of vessels. The forwarder also has agents in foreign countries soliciting traffic to be brought by his vessels to the United States.

A company engaged in forwarding freight by its own line of vessels ordinarily assembles and distributes most of its traffic by one line of railroad, in return for which the railroad company may construct a pier to be used exclusively by vessels belonging to the freight forwarder's line; and the railroad company may also provide such other terminal facilities as the forwarder may require. Such an arrangement, however, does not preclude the forwarder from soliciting freight from any and all places on the lines of other railroads, nor from seeking traffic at the terminal port from vessels, barges, railroad companies, and individual shippers.

The efforts made by American railroad companies to increase the over-sea foreign commerce of the United States have had an important influence upon the organization of the transportation service. In order to secure foreign outlets for the products of the sections served

by the railroads and to increase the volume of imports of foreign-made goods, and thereby to add to the tonnage of traffic moved over their lines, our railroad companies, particularly those leading to the Pacific ports, have established lines of steamships running to many of the leading foreign ports.

The extent to which the ocean transportation service on the Pacific is performed by companies identified with or auxiliary to the railroad corporations, may be shown by referring to the steamship lines operated from Vancouver, the American Puget Sound ports, Portland, and San Francisco.

The Canadian Pacific Railway-Steamship Company, controlled by the Canadian Pacific Railway, operates a line of five steamers between Vancouver and the Orient. This is an important mail line, and is liberally supported by the Canadian and British Governments, not only because of the mail service it performs, but because it is considered as a military highway to India. This ocean line was inaugurated as soon as the Canadian Pacific reached Vancouver; at first chartered vessels were used, but later the present excellent steamers were purchased by the company. The Canadian Pacific interests also operate from Vancouver an Australian line of two chartered vessels, which are run in coöperation with the Union Steamship Company of New Zealand, the vessels of the two companies being dispatched on alternate sailings.

At Seattle there are four important steamship lines, two of which are controlled by American railroads. One of these lines is operated by the Great Northern Steamship Company, the celebrated vessels, the *Minnesota* and *Dakota*, being employed in this service. The Great Northern Steamship Company operates its vessels upon a schedule of sailings alternating with the sailings of the vessels belonging to the Nippon Yusen Kaisha (Japanese

Steamship Company). The two companies do not pool their earnings, but act in harmony as regards rates, dates of sailings, and other matters of common interest.

The Northern Pacific Steamship Company operates three vessels between Puget Sound ports and Hongkong, having alternate sailings with the four steamers operated by the Boston Steamship Company. The Northern Pacific Company is affiliated with the Northern Pacific Railway. These vessels carry both freight and passengers, but the ships of the Boston Steamship Company are engaged only in the freight service.

From Portland, Ore., the Portland and Asiatic Steamship Company operates a line of vessels to Japanese and Chinese ports. This company has close traffic arrangements with the Oregon Railroad and Navigation Company (a coastwise line) and the Oregon Short Line Railroad. Both the Oregon Navigation Company and the Oregon Short Line Railroad belong to the Harriman interests, which also control the Portland and Asiatic Steamship Company.

From San Francisco there are five lines of vessels operated to Oriental ports and one line to Australia. Of the several lines to Oriental ports, two of the four important lines are the Pacific Mail and the Occidental-Oriental Companies controlled by the Southern Pacific Railroad interests. A third line is the Toyo Kisen Kaisha, controlled by Japanese capitalists, and a fourth is the China Commercial Line, a British corporation.

The history of the relations of the Pacific Mail, the Occidental-Oriental, and the Toyo Kisen Kaisha lines, is most interesting. The Pacific Mail began its over-sea services in 1869, at the time of the completion of the first Pacific railroad. Five years later this first Pacific railroad, the Union and Central Pacific Line, became dissatisfied with the arrangement it had with the Pacific Mail,

and consequently chartered four vessels belonging to the White Star Line, and established the Occidental-Oriental Steamship Company. A severe rate war between the two companies ensued, with great loss to both, followed by an agreement regarding rates, schedules, and other conditions of the service. The two companies established joint agencies, and took steps to prevent rate cutting and discriminations; they worked separately, but in friendly competition. In the early nineties the Southern Pacific purchased the Pacific Mail, and thus brought the two companies under the same control. In the later nineties the Toyo Kisen Kaisha announced its intention of engaging in the traffic between Japan and San Francisco. The Southern Pacific interests decided to avoid a rate war by entering into a traffic agreement with the new competitor, and the three lines are now worked in harmony.

The Oceanic Steamship Line, from San Francisco to Australia by way of Honolulu and New Zealand, is apparently not under railroad control. From 1875 to 1889 the Pacific Mail had an Australian service; but in 1889 the Pacific Mail ceased running its vessels to Australia, and since then the Canadian Pacific Mail from Vancouver and the Oceanic Line from San Francisco have had control of the Australian-American business.

The coastwise traffic of our Pacific States is also largely handled by lines controlled by the railroads. The Oregon Railroad and Navigation Company, mentioned above, controlled by the Harriman interests, is one of the coastwise lines. Another important one is that operated by the Pacific Coast Steamship Company, controlled by the Great Northern Railway interests. The vessels of this company touch at all the important points from Victoria and Seattle on the north to Guaymas and Mazatlan in Mexico. The most important Pacific coastwise line is that operated by the Pacific Mail Steamship Company, with its large traffic

between San Francisco and Panama, including the traffic of intermediate points in Mexico and Central America. The export trade from our Pacific coast to Europe is mainly controlled by British and German lines; these foreign companies are not, however, permitted by our laws to engage in the American coastwise trade.

In the commerce, both foreign and coastwise, of the Atlantic and Gulf coasts, the coördination of the ocean and rail carriers is less complete than on the Pacific seaboard. The reasons for this are both historical and economic. The ocean transportation service across the North Atlantic was well organized and highly developed long before the railroads began to carry a large volume of traffic for export. As the railroads have increased this traffic they have, in the main, made use of previously existing ocean carriers, who have developed their facilities with the growth of the tonnage turned over to them by the railroads. Moreover, the tonnage of the North Atlantic traffic is so large, and the variety of commodities handled is so great, that ocean transportation facilities, independent of the railroads, are readily provided.

The trade of a great port like New York reaches out to all parts of the world, and includes not only the commerce of the large foreign ports with which there is a heavy and regular volume of trade, but also the smaller and more out-of-the-way foreign sources of our international trade. To handle such a commerce as New York city has, special ocean carriers are necessary; there is need not only for a few large steamship lines such as the railroad interests might provide, but also of the services of smaller lines and independent vessels. This fact, together with the historical reason just given, explains why the vast foreign trade of New York is handled by carriers independent of our great railway systems.

The situation in the Atlantic ports of the United States

other than New York is different, and several steamship lines from the "out-ports" are operated by or in affiliation with railroad companies. From Newport News, the Chesapeake and Ohio Railway Company operates a steamship line to Liverpool and London. From the port of Philadelphia, the Reading Railway Company operates the Philadelphia Transatlantic Line to London and Avonmouth. Formerly the Pennsylvania Railroad Company controlled the American Line whose vessels now run to Liverpool and Southampton, but this line has now passed under the control of another group of capitalists.

When the American Line started, in 1871, it was owned by individuals interested in the Pennsylvania Railroad, and the bonds of the company were guaranteed by the Pennsylvania Railroad; twenty years later the American Line passed under the control of the International Navigation Company, also managed by individuals more or less closely connected with the Pennsylvania Railroad. The International Navigation Company was established to carry traffic between Philadelphia and Antwerp, and although the company had no official connection with the Pennsylvania Railroad, the business relations of the two companies were friendly and close. In 1902 the International Navigation Company—including, of course, the American Line—was purchased by the International Mercantile Marine Company, composed of a large group of capitalists, American and foreign. The Pennsylvania Railroad no longer has even unofficial control of any ocean steamship line.

The foreign commerce of Boston and Portland is apparently handled by steamships independent of railroad control; farther north, however, the Canadian Pacific Railway has a transatlantic line, which, together with numerous steamship companies independent of the railroads, carries on the trade of Canada with Europe.

The coastwise traffic of the Atlantic and Gulf seaboard ports of the United States is handled mainly by three different groups of carriers:

1. The steamship lines which do a general freight and passenger business. While there are several important coastwise steamship lines, their number is relatively small, considering the volume of business.

2. The vessels operated by companies engaged in the manufacture and sale of lumber. The large lumber traffic coastwise is handled mostly by the lumber companies.

3. There is a heavy barge traffic in coal, especially from Norfolk and Newport News northward. This coal traffic is handled partly by individual carriers.

As the railroad companies are not engaged in the manufacture and sale of lumber, there is no connection between the railroads and the transportation of lumber coastwise. Several of the railroad companies leading to the North Atlantic seaboard are large owners and miners of anthracite coal. The Philadelphia and Reading Railway, the largest coal road, has an extensive coastwise service. In the case of the other hard-coal roads there is no direct connection between the railroad companies and the coastwise traffic in coal. The railroads do not engage in the coastwise transportation of soft coal, and the individual companies which conduct this coastwise coal transportation are distinct from the rail carriers; but the influence of the railroad companies upon the business of moving coal by water amounts in many instances to a virtual, though indirect, control.

There are two important coastwise lines owned and controlled by railroad companies. The larger one of these two is the Morgan Line, which operates a large fleet of vessels between New York and New Orleans and Galveston. The other distinctively railroad coastwise steamship line is the Old Colony Steamboat Company, controlled by

the New York, New Haven and Hartford Railroad. This line connects New York with Providence, Fall River, and other New England ports. Most of the general steamship lines engaged in coastwise business are managed by companies independent of railroad domination. It is, however, generally understood in financial circles that several of the steamship lines are controlled by men who have important holdings in the stocks of our Eastern railroad systems.

The vast coastwise trade of our Great Lakes is largely handled by vessels belonging either to the United States Steel Corporation, the Standard Oil Company, or the railroads having lake connections. The Grand Trunk, the New York Central, the Erie, the Lehigh Valley, the Delaware, Lackawanna and Western, the Pennsylvania, the Baltimore and Ohio, and the Great Northern railroad companies have lines of steamers operated on the Great Lakes for the purpose of enabling the railroad companies to participate more advantageously in the commerce originating and terminating in the region about the Great Lakes.

The policy of the British railroad companies has been to establish steamship lines from the British Isles to the leading Continental ports. The coöperation of rail and ocean carriers is more complete in the United Kingdom than in America. Although the British railroad companies, like most of the American railroads serving the Atlantic ports of the United States, have not found it necessary to establish transatlantic lines, the British railroads have found it advantageous to provide facilities for the direct and speedy handling of traffic between interior points in the United Kingdom and Continental ports. Traffic both within the United Kingdom and between the United Kingdom and the Continent is divided up territorially among the leading railway companies and their steamship lines; and excellent facilities have been de-

veloped for carrying on the great trade between the British Isles and the Continental countries of Europe.

The coördination of the rail and ocean transportation services is becoming increasingly close. This higher degree of coördination will be an advantage to the shipper, unless it results in giving the carrier a monopoly that enables him to charge unreasonably high rates and to restrict his services to the more profitable branches of traffic. The shipper, however, is in little danger of suffering from monopoly in the ocean transportation service, because the all-pervading competition prevailing on the ocean gives the shipper a safeguard against extortion, as far as ocean transportation charges are concerned.

The growing consolidation of railroads may well give the shipping public some concern, because the scope of competition among land carriers can be largely restricted by monopoly and combination of rival railroads. Indeed, the interests of the shipper require that the influence of competition upon railway charges should be supplemented by an intelligent governmental regulation of the railroad service; but with competition to safeguard his interests upon the ocean, and with real governmental regulation of the railroad service, the shipper may welcome the fullest measure of coöperation among rail and ocean carriers.

## REFERENCES FOR FURTHER READING

The information presented in this chapter was mostly obtained by Dr. J. Russell Smith, Mr. Thomas Conway, Jr., and the author, by correspondence and interviews with men engaged in shipping. There is little printed literature upon the subject of the coöperation and combination of rail and ocean carriers. Some fragmentary data may be obtained from the Annual Reports of the Commissioner of Navigation, Washington, D. C., and from the "List of Steamer Lines Plying between Ports of the United States and Foreign Ports," compiled by the Bureau of Statistics, and published in the *Monthly Summary of Commerce and Finance of the United States*, August, 1903.

# CHAPTER XIII

## OCEAN FARES AND RATES

Ocean fares and rates include the charges for carrying the mails, conveying passengers, and transporting various kinds of freight. The purpose of this chapter is to explain how the charges for each service are fixed and maintained, and to discuss the influence of competition; to show, in other words, how the forces discussed in the two preceding chapters operate in the making and regulation of ocean transportation charges.

The payments received by the steamship companies for carrying the mails were explained in Chapter VII, and little additional need be said. In letting ocean mail contracts the Government sometimes asks for competitive bids, and sometimes, without advertising for bids, makes arrangements with various companies in accordance with the provisions of general statutes. Not infrequently special laws authorize the executive department of the Government to negotiate for a particular mail service; and this is especially the case where shipping subsidies are included in mail payments; as, for example, Great Britain's contract with the Cunard Steamship Company, and the contracts of the German Empire with the North German Lloyd Company.

Mail payments are only partially determined by competition. Practically, all governments pay vessels of their own flag more for carrying the mails than they pay or would need to pay foreign vessels. The payments by the

United States Post-Office Department for carrying the ocean mails under the "noncontract" plan of payment are an instance of giving the domestic vessel more than the foreign one for the same service; and under the contract system, also, the United States pays more to American ships for carrying the mails to Europe than foreign steamship companies would charge.

Theoretically, the ocean mail contracts let by the United States under the Act of March 3, 1891, are competitive, the law stipulating that "said contracts shall be made with the lowest responsible bidder," and that "the rate of compensation to be paid . . . shall not exceed the sum of" four dollars, two dollars, one dollar, and two thirds of a dollar, according to the class of the ship, per mile of the outward voyage; but the number of lines now engaged in foreign commerce under the American flag is so small, that there is practically no competitive bidding under the Act of 1891, and the sums paid by the Postmaster-General for each of the seven contracts in force are the maximum rates authorized by the law.

The most important characteristic of contracts for the transportation of ocean mails is that the payments cover not only the mail service, but also numerous other obligations on the part of the steamship, the purpose of the country making the contract being to promote its mercantile and naval interests. This is equivalent to saying that the basis of ocean mail payments is political rather than commercial; that they are determined primarily neither by monopoly nor by competition, but by the policy adopted by each country to strengthen its industrial, commercial, and naval position among the competing nations.

Passenger traffic is handled entirely by steamship lines. The fares charged are competitive, but as the business is handled only by companies operating a relatively small number of large lines operated over well-established

routes, the competing carriers are able to regulate competition to some extent by agreements as to rates, routes, frequency and dates of sailings, and speed. The regulation of cabin fares has usually been found to be relatively easy to arrange by conference and agreement among competing lines; but in the steerage service and charges it has been found more difficult to restrain competition. Ocean passenger rate wars ordinarily arise in connection with the steerage business, where the largest profits are obtainable, and where the incentives to rate cutting or to the invasion of a rival line's territory are strongest.

In the development of the ocean cabin passenger service the policy followed has been similar to the policy adhered to in the development of the American railway passenger business. In the case of American railroads and of ocean carriers the active competition of rival lines has resulted rather in a betterment of the service—greater speed, comfort, and luxury—than in a reduction of fares. Ocean cabin passengers are able to pay for an expensive service, and their demand for speed and comfort is stronger than their demand for low fares. American railway companies also—whether wisely, may well be questioned—have, in the main, adhered to the method of attracting traffic by improving the service rather than by providing an inexpensive and slow service at low fares; consequently railroad passenger fares have declined very slowly in the United States. Likewise, cabin fares on the ocean have not been lowered with the mechanical progress of ocean transportation. Instead of giving the passenger the same speed and comfort at declining fares, the tendency has been to give him a shorter voyage and more luxurious accommodations at the same or a higher fare.

In the management of the third class, or steerage traffic, the steamship companies have improved the service greatly and have lowered the fares. The competition of

the North Atlantic lines for the steerage traffic has been keen and persistent, because the business has been profitable and has increased with great rapidity. To stimulate this profitable traffic and to hold it against competitors, the leading steamship companies, particularly during the past ten years, have given the steerage passengers the advantage of speed, and have made their accommodations incomparably more comfortable than they were. The growth of the traffic has been so rapid that the steamship companies have been able to provide this better steerage service at declining fares, and have thus been able to add to the volume of steerage traffic by offering both moderate fares and a speedy, comfortable service to the working classes of Europe ambitious to better their condition by emigrating to America or Australia.

The rivalry of ocean carriers in the freight service being keener than for the passenger traffic, freight rates are more strongly competitive than are passenger fares. The main reason for this is that the passenger business is handled by a limited number of steamship lines, whereas the greater tonnage of the freight traffic may be transported either by line vessels or by chartered ships, steam and sail, which have no fixed routes and schedules, and are thus free to bid for traffic wherever it may be found.

Competition in ocean freight rates is stronger and more general than in railroad rates. Dr. J. Russell Smith explains this by stating that "the most fundamental difference between ocean transportation and land transportation as typified by the railroad is in the element of fixed capital, the roadbed and terminal facilities, which are so all-important with the railroad, and upon which the steamship company spends so little. This may be called the organic difference between the two. It profoundly affects the making of rates, for the railroad has a tendency to combination, monopoly, or agreement, re-

sulting in fixed and settled rates, while the ocean is free, open to competition, and the scene of ever-shifting rates." [1]

The possibility of limiting competition in railway rates is greater than in ocean rates, and the railroad service is more monopolistic than ocean transportation. Even in the railroad business, however, there are competitive forces influencing charges—forces that persist even among consolidated railroads [2]—and the railroad service is a partial rather than a complete monopoly. In the ocean transportation service, agreements or even combinations of carriers are less potential over rates than are railroad consolidations. Competition on the ocean is more forceful, rates change frequently, and correspond in general with the ratio of traffic to shipping facilities.

In studying ocean freight rates it is necessary to keep in mind that ocean freight traffic consists of two distinct kinds: (*a*) full vessel cargo shipments, and (*b*) partial (or "berth") cargo and "line" or general cargo freight. The rates for these two kinds of shipments are controlled by different forces.

(*a*) When commodities are shipped as full vessel cargoes the freight charges consist of the rent paid for the use of the vessel "chartered" to perform the service. Rates on full cargoes are called charter rates. Vessels may be chartered either (1) for a single or round-trip voyage, or (2) for a definite period of time—thirty days, six months, or a year; hence there are "trip charters" and "time charters." The ordinary payment for a trip charter is a certain rate per ton on the *cargo*, or, if grain, a certain rate per bushel, per hundred, or quarter; while the basis upon which the payment for time charters rests

[1] "The Organization of Ocean Commerce," p. 34.

[2] Consult the author's volume on "American Railway Transportation," Chapter XVIII.

is the tonnage of the *vessel*, the rate being a certain amount per vessel ton per month. A blank "Charter Party" is reproduced. This is the contract executed when a vessel is chartered to carry a cargo of grain.

The chartered vessel is leased to the shipper by the owner, who also operates the vessel, provides the crew, supplies the food and fuel, and keeps the vessel in repair. In the case of trip charters, the owner pays all the expenses of operation, including port charges for clearing and entering the vessel, and the shipper pays only the freight charges agreed upon in the charter contract. The provisions of time charter contracts vary, but ordinarily the owner supplies and provides for the crew and keeps the ship in repair, while the charterer furnishes the fuel and pays the port and terminal charges. The rate paid per vessel ton per month for time charters will, of course, depend upon the obligations assumed by the owner and by the charterer.

No prices could be more competitive than charter rates; they fluctuate with every slight change in the ratio of traffic to shipping. There is a world-wide competition among vessel owners to secure desirable cargo shipments —a competition that is made possible by means of ship brokers who are to be found in all large cities, and who are, by means of the network of telegraph and cable lines that bind together all commercial centers, kept in touch with each other and with the shippers having cargoes for transportation. The nature of the competition in charter traffic, and the work of the shipbroker, are graphically described as follows by Dr. Smith, in his work on "The Organization of Ocean Commerce":

The method of securing cargoes for ships, and ships for cargoes, is best described by the relation of some common incident of every day occurrence. A Liverpool shipowner had a steamer in the Mediterranean loaded with jute, which she was carrying from

**PETER JAMES & SONS,**

35-37 WALNUT STREET, PHILADELPHIA

MORRIS BUILDING, BROAD AND BEAVER STS., NEW YORK.

CABLE ADDRESS: { JAMES, PHILADELPHIA. / JAMES, NEW YORK.

FREIGHTING DEPARTMENT
REPRESENTED IN THE UNITED KINGDOM BY
JOHNS. & TOWNSEND,
18, 19 AND 20 GREAT ST. HELENS, LONDON, E. C.
CABLE ADDRESS, ALBANA, LONDON.

# STEAM.

## PHILADELPHIA—GRAIN—BERTH TERMS.

*Philadelphia*, ______________

**Parties in interest and Description of Vessel.**

1. It is this day Mutually Agreed, *BETWEEN* { PETER JAMES & SONS, by Cable authority of ______________

Agents for ______________ Owners of the ______________ Steamship ______________ of ______________, built ______________ at ______________ of ______________ net tons register, or thereabouts, and guaranteed ______________ Qrs. of 480 lbs. of heavy Grain, ___ per cent. more or less capacity and/or ______________ Qrs. of 320 lbs. of Oats, 10 per cent. more or less capacity, classed ______________ in ______________ now ______________ and ______________

**Loading Ports.**

2. That the said Steamship being tight, staunch and strong, and in every way fitted for the voyage, with liberty to take outward cargo to ______________ for owners' benefit, shall with all convenient speed sail and proceed to ______________ and there load, always afloat, from said charterers, or their agents, a

**Description of Cargo.**

full and complete cargo, subject to limits above guaranteed of WHEAT, INDIAN CORN, RYE and/or OATS.

**Orders for Loading Port.**

3. Orders as to loading port to be given within 24 hours after receipt of notice of arrival at port of call in the United States, if in ballast; or before 12 o'clock noon on the day of completion of discharge at a port in the United States, if with cargo, except on Saturdays, when orders shall be given before 11 o'clock A.M. If not discharged on the day on which demand for loading port is made, vessel to ask again for orders.

**Loading Under Inspection.** 4. Vessel to load under inspection of Underwriters' Agents, at her expense and to comply with their rules, not exceeding what she can reasonably stow and carry over and above her Cabin, Tackle, Apparel, Provisions, Fuel and Furniture; and being so loaded shall therewith proceed to LONDON, LEITH, TYNE, LIVERPOOL, GLASGOW,

**Discharging Ports.** HULL, PLYMOUTH, SOUTHAMPTON, AVONMOUTH, BELFAST, DUBLIN, ANTWERP, ROTTERDAM or AMSTERDAM, ________________

________________

one Port only, as ordered on signing Bills of Lading, and deliver the same, agreeable to Bills of Lading, on being paid freight, in British Sterling or its equivalent, as follows: (but free of extra freight in Bills of Lading if ordered to London).

**Rate of Freight.** ________ shillings and ________ pence ( ) Per quarter of 480 lbs. of Heavy Grain.
________ shillings and ________ pence ( ) Per quarter of 320 lbs. of Oats.
all English weights delivered.

**Additional Discharging Ports.** 5. Charterers having the privilege of ordering vessel to ________________ in which case rate of freight shall be ________ pence per quarter more than the above rate ________

________________

________________

________________

**Liability of Steamer Under Charter.** 6. It is also mutually agreed that the Carrier shall not be liable for loss or damage occasioned by causes beyond his control, by the perils of the seas or other waters, by fire from any cause or wheresoever occurring, by barratry of the master or crew, by enemies, pirates or robbers, by arrest and restraint of Princes, rulers or people, by explosion, bursting of boilers, breakage of shafts or any latent defect in hull, machinery or appurtenances, by collisions, stranding or other accidents of navigation of whatsoever kind (even when occasioned by the negligence, default or error in judgment of the pilot, master, mariners or other servants of the ship owner, not resulting, however, in any case, from want of due diligence by the owners of the ship or any of them, or by the Ship's Husband or Manager.)

**Harter Act.** 7. It is also mutually agreed that this contract is subject to all the terms and provisions of, and all the exemptions from liability contained in the Act of Congress of the United States, approved on the 13th day of February, 1893, and entitled "An Act Relating to Navigation of Vessels, etc."

**Signing Bills of Lading.** 8. Captain to call at Brokers' Office, as requested, and sign Bills of Lading, as presented, without prejudice to this Charter Party, any deficiency to be paid at Port of Loading in cash, less insurance, and any surplus over and above

**Difference in Freight.** estimated freight to be settled there before the Vessel clears at the Custom House, by Captain's draft, in Charterers' favor, upon Consignee, payable five days after arrival at Port of Discharge.

**Stevedore.** 9. Stevedore employed by Vessel to be approved by Charterers.

**Lay-days and Demurrage.** 10. Steamer to be loaded according to berth terms, with customary berth despatch, and if detained longer than five days, Sundays and holidays excepted, Charterers to pay demurrage at the rate of four pence (4 d.) British Sterling or its equivalent per net register ton per day, payable day by day, provided such detention shall occur by default of Charterers or their agents.

**Date of Commencement of Charter.** 11. Time for loading, if required by Charterers, not to commence before the________day of____________

**Cancellation of Charter.** 12. Should the Steamer not be passed by Board of Underwriters' surveyor as ready for cargo at her loading port before 12 o'clock noon on the________day of________followed by the presentation of said surveyor's pass to the Charterers or their agents at their office before said hour, the Charterers or their agents shall at said hour and at any time after, not later than presentation of the surveyor's pass at said office, have the option of cancelling this Charter Party.

**Bills of Lading and Discharging.** 13. It is also mutually agreed that this contract shall be completed and be superseded by the signing of Bills of Lading on the same form as in use by regular line steamers from loading port to port of destination; or, if port of destination be one to which there is no regular line of steamers from loading port, this contract shall be superseded by the signing of Bills of Lading in the form customary for such voyages for grain cargoes, which Bills of Lading shall however contain a clause providing for discharging as fast as vessel can deliver during ordinary working hours, any custom of the port to the contrary notwithstanding.

**Discharging at Night.** 14. Receivers of the cargo are in no case obliged to take delivery at night without their consent, and in any event the steamer must bear all extra expenses incurred by working at night. This clause to be expressly stipulated in all Bills of Lading.

**Dead Freight, Demurrage.** 15. Charterers' liability under this Charter to cease on cargo being shipped, but the Vessel to have a lien thereon for all freight, dead freight, demurrage or average.

**General Average.** 16. General Average, if any, according to York-Antwerp Rules, 1890.

**Disbursements.** 17. Cash for vessel's ordinary disbursements at Port of Lading to be advanced by Charterers, if required by Master, at current rate of exchange, subject to insurance and two and a half per cent. commission.

**Commission, Freight Brokerage, Agency.** 18. A commission of five per cent. and the customary Freight Brokerage is due by the Vessel on signing of this Charter Party to **Peter James & Sons,** Vessel lost or not lost, whose agents at Port of Loading are to attend to ship's business on customary terms.

________________Witness to the signature of

________________

By cable authority of

Agents for Owners.

________________Witness to the signature of

________________

WE HEREBY CERTIFY That this is a true and correct copy of the original stamped Charter Party on file in our office.

________________

**BROKERS.**

Calcutta to Dundee. The owner desired another cargo for the steamer at the end of the voyage. Knowing that there was nothing in Dundee, he wrote to his agent in Newcastle, and himself made inquiries among the shippers of Liverpool. The Newcastle man suggested a cargo of coal to Hamburg, but it was declined, and he sought the aid of his correspondent in Dumbarton, but the iron trade of Dumbarton was not promising. Meanwhile the days were passing, the vessel had reached Dundee, and there was nothing provided for her. The Liverpool man was himself the correspondent of a London firm of shipbrokers, who telegraphed him at this juncture that they had offers of a shipment of German coke to go from Rotterdam to Santa Rosalia, Lower California, and of another of Cardiff coal for Buenos Ayres. The first the shipowner declined, as being suitable only for a sailing vessel, and because of news from across the Atlantic he allowed the second to go to a steamer then lying at Antwerp. Three days before this he had cabled to his New York correspondent a description of the steamer, and offering her services to carry grain to the United Kingdom at a certain rate, and saying that she could load after a certain date or between certain dates. As New York freight was dull, the firm in that city telegraphed their Boston and Philadelphia agencies. At the same time a Chicago grain exporter decided to export 150,000 bushels of corn, and telegraphed to his agents in New York and Philadelphia to secure offers of transportation. In the shipping exchanges of those cities the representatives of the Chicago exporter and the Liverpool shipowner bargained face to face. Offers were, however, made at the same rate by the New York representative of the owner of a ship then off Rio Janeiro with a cargo of Chilean nitrate bound for New York, and also by a Philadelphia broker who sought future employment for a vessel then in the Red Sea with a cargo of Java sugar for Philadelphia. The Liverpool owner was informed of this competition, and still having nothing for his steamer, he cabled that he would charter his ship for threepence (six cents) less per ton, or for the same rate he would take freight to continental ports as far as Copenhagen. He added to his cablegram the word "range," which means in cable code that he would send the ship to Delaware Bay with the understanding that she might be ordered to New York, Philadelphia, Baltimore, or Norfolk, to load. This offer secured the freight, for the representatives of the sugar ship and the nitrate ship, having more time

at their disposal, preferred to take chances rather than cut rates. The steamer, which, pending negotiations, was still lying at Dundee, proceeded to Newcastle to coal, and departed thence in ballast for the Delaware. Meanwhile the Chicago exporter found that railroad conditions made Norfolk the most convenient port to deliver his corn at the appointed time. When the steamer reached the Delaware Breakwater (just inside Cape Henlopen) the captain received telegraphic instructions to go to Norfolk. There he loaded a full cargo of corn, and as the final destination of the corn was still undecided, he sailed to the Channel port of Falmouth for orders. There he was instructed by signal to proceed to Copenhagen, where the corn was discharged, and the vessel was ready for another contract which the agents had been trying to arrange since the day they learned of the final destination of the corn cargo.

(*b*) General freight dispatched in small quantities, or in less than full cargoes, is shipped at a certain rate per ton, weight, or measurement. Such freight is ordinarily handled by line vessels having regular routes and schedules of sailings; but this is not always the case, for it frequently happens that both chartered and line vessels may seek shipments of small quantities to complete the lading of the ships, or shipments of some special kind of a commodity needed as a complement to the main cargo. A vessel loading with cotton will gladly take a part cargo of steel rails or pig iron to place in the bottom of the vessel; and *vice versa*, a ship whose chief cargo is heavy freight, will welcome shipments of a light and bulky character that will take up the unoccupied space with profitable cargo.

This search for freight to complete or complement the cargo of a chartered or line vessel introduces bargaining methods into the making of rates on at least a part of the freight shipped as general cargo. The same vessel frequently will carry not only many kinds of commodities at a different rate for each class of articles, but will also carry the same commodity or class of commodities at

various rates for different shippers, the rate granted by the carrier being fixed by special bargain, and determined by the urgency of the carrier's desire to secure the particular shipment in question.

To some extent commodities shipped as general cargo are classified. When ocean traffic is classified the rates vary with classes, all articles in a single class having the same rate when shipped to the same point. However, the classification of ocean traffic, for reasons that have already been explained, comprises but a relatively small part of the articles and the tonnage transported in maritime commerce. For the greater share of ocean tonnage the rates are for articles rather than for classes.

Ordinarily, general cargo is shipped at the competitive rates prevailing at the time of the shipment for the articles offered to the carrier for transportation. Carriers directly and through their agents solicit freight in all the large industrial and commercial centers, and rival carriers compete in the rates they offer shippers. This competition tends to become so severe as to destroy profits, except during periods of unusual business prosperity, and vessel owners seek to regulate their rivalry by means of the "conferences," rate agreements, and rebates to shippers, as described in a previous chapter.

Conference agreements, as has been explained, are applicable mainly to the line traffic of special routes or of certain traffic areas; they have as yet included only a limited share of the total maritime commerce of the world, and, where established, the conference agreements have required frequent amendment or reconstruction. The "conferences" have regulated rather than eliminated competition in that minor portion of the world's commerce to which they have been applied. The regulation accomplished by the conferences has on the whole been advantageous both to shippers and carriers, because the agree-

ments of rival lines have made ocean rates somewhat more stable, without being able to make the rates extortionate. The forces of competition pervade the ocean transportation service, and protect even the shippers whose traffic is covered by conference agreements of rival ocean carriers.

A minor portion of the freight handled as line traffic is taken at rates fixed by time contracts between large shippers and freight forwarders or carriers. The manager of a line of vessels is glad to secure freight in advance, because a steady volume of traffic, even at moderate rates, is ordinarily more profitable than a fluctuating tonnage at current rates. The manufacturer or exporter engaged largely in the foreign trade can carry on his business more advantageously if he has an advance guarantee of the shipping facilities his traffic will require week by week or month by month, and if he knows what freight rates he will have to pay to place his products upon the foreign market. The time contracts between shipper and carriers cover various periods—a month, a season, or a year—and stipulate that the carrier shall provide facilities for transporting a designated tonnage of the shipper's wares or products at such dates and at such rates as are named in the agreement.

A shipment amounting to less than a full cargo, or aggregating only a few hundred tons, may frequently be shipped as "berth cargo." A line vessel loading at such a port as New York, for example, may have miscellaneous and profitable freight enough to occupy three fourths of the vessel, but not enough to complete the lading. Such a vessel will offer "berth" space to an exporter of grain or some bulky freight at low rates. Ordinarily the exporter of grain and bulky articles will prefer to ship in full cargo lots, and he will not accept berth space except at low rates; the vessel owners, however, will prefer to

have the berth traffic at low rates to sailing without a full load, because the additional tonnage will add but little to the expense of the trip, and will add appreciably to the ship's gross receipts. Nearly all of the grain exported from New York city is handled as berth cargo; whereas from a port like Baltimore or Philadelphia, where the amount of exports is less and their variety is limited, and where there are fewer vessels seeking cargo, grain and similar articles are usually shipped in full vessel cargoes.

Sometimes, as Dr. Smith says,[1] the vessel seeking berth traffic is one that has "just completed a charter contract, and is sent on a single disconnected and rarely repeated voyage in which she carries freight on the basis of a liner, and makes the rates after the manner of a chartered vessel. A vessel is said to be put upon the berth when a steamship agent in some port announces that if sufficient freight is offered, he will dispatch a certain vessel to a certain port at about a certain date. This is more apt to occur at the end of a route, where more freight is received than dispatched. Thus vessels are put upon the berth in Australasia, China, Japan, and the Straits Settlements, to load for the Atlantic; or in Europe, to load for America, and occasionally also, in the heavy exporting ports, to load outward freight."

The rates for berth traffic are competitive to the fullest extent, and fluctuate through a much wider range than the rates either on line or on charter traffic; because the freight charges for berth traffic depend not upon the general relation of the volume of traffic to the supply of shipping facilities, but upon the urgency of some particular carrier's need of securing a limited tonnage of commodities within a short space of time. Line and charter traffic is moved at average or normal rates, berth traffic at emergency rates.

[1] "The Organization of Ocean Commerce," pp. 48, 49.

Ocean traffic, in part, originates at interior points, and is shipped by rail and water on through bills of lading to the foreign destination at some seaport or inland center of consumption or distribution. On export traffic shipped abroad from inland points within the United States the ocean carrier now usually receives the through rate, less the regular rail rate, and the fluctuations in the through rate generally affect only the ocean rate, and not the rail charge. On traffic imported from abroad directly to some interior city within the United States, the American rail carrier frequently receives a *percentage* of the through rate, in which case the variations in the through charges affect the railroad company's share, as well as the portion received by the ocean carrier.

Formerly, the competition of American railways for the import traffic was such that their regular practice was to take the traffic at a small percentage of the fluctuating through rate, and rail charges on imported commodities were often only a fraction of the charges for transporting similar domestic articles. While the former practice of discriminating against the maker and shipper of domestic articles, and in favor of the manufacturer and the shipper of foreign commodities, has not altogether ceased, the extent of the practice and the amount of the discrimination against the American shipper have been much lessened by the more effective regulation of inter-railway competition made possible by the higher organization of the railway service, and by the coöperation and consolidation of rival railroads.

Ocean-freight rates, like railway rates, have declined as technical improvements have reduced the costs of transportation. The economies resulting from the use of more efficient marine engines and of vessels of greater carrying capacity have been accompanied by lower rates. In this regard the ocean-freight traffic differs from the

passenger service, in which the betterments of service, as regards speed, comfort, and luxury, have required additional expenditures that have fully offset the economies gained by the technical improvements.

### OCEAN RATES OF FREIGHT. INWARD AND OUTWARD

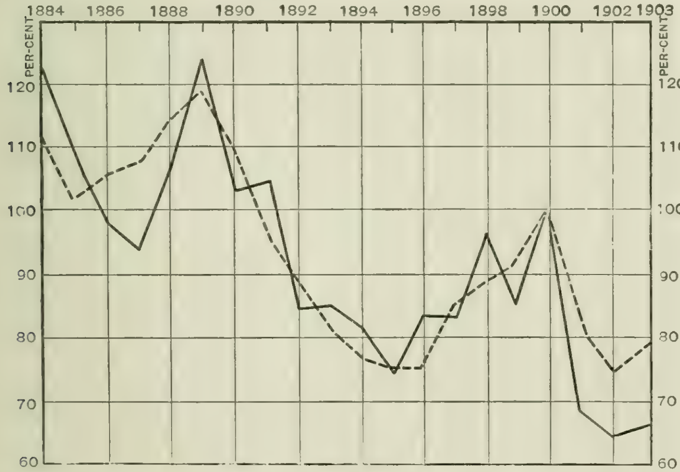
STATEMENT SHOWING THE PERCENTAGE FLUCTUATIONS IN MEAN YEARLY FREIGHT RATES BETWEEN THE UNITED KINGDOM AND CERTAIN PORTS ABROAD DURING EACH OF THE YEARS 1884–1903, AS COMPARED WITH MEAN RATES FOR THE YEAR 1900. THE PERCENTAGE FLUCTUATIONS IN WHOLESALE PRICES OF COMMODITIES ARE ADDED FOR COMPARISON. (1900 FIGURE EQUALS 100 PER CENT.)

| OCEAN FREIGHT RATES. | | | Mean of preceding columns. | Index Number of Wholesale Prices of Commodities.[1] |
|---|---|---|---|---|
| Year. | Inward. | Outward. | | |
| 1884 | 121.7 | 110.7 | 116.2 | 106.1 |
| 1885 | 106.9 | 101.0 | 104.0 | 99.8 |
| 1886 | 98.0 | 105.0 | 101.5 | 94.4 |
| 1887 | 94.6 | 105.6 | 100.1 | 92.2 |
| 1888 | 107.3 | 114.0 | 110.7 | 95.3 |
| 1889 | 125.4 | 119.2 | 122.3 | 97.1 |
| 1890 | 102.8 | 110.5 | 106.7 | 99.5 |
| 1891 | 104.4 | 95.5 | 100.0 | 101.1 |
| 1892 | 84.3 | 89.3 | 86.8 | 96.3 |
| 1893 | 84.8 | 82.3 | 83.6 | 94.6 |
| 1894 | 81.2 | 78.3 | 79.8 | 90.3 |
| 1895 | 74.8 | 75.7 | 75.3 | 86.8 |
| 1896 | 82.8 | 76.0 | 79.4 | 83.9 |
| 1897 | 81.8 | 84.0 | 82.9 | 85.7 |
| 1898 | 96.5 | 88.9 | 92.7 | 88.5 |
| 1899 | 83.7 | 91.7 | 87.7 | 89.5 |
| 1900 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1901 | 69.1 | 80.8 | 75.0 | 95.2 |
| 1902 | 65.2 | 76.1 | 70.7 | 94.7 |
| 1903 | 66.6 | 78.9 | 72.8 | 94.4 |

[1] See "Report on Wholesale and Retail Prices" (House of Commons Paper, No. 321, of 1903), p. 34. The figures have been converted to the basis of 1900 as the standard year.

The actual fluctuations in ocean-freight rates, and the decline in charges, are not easily shown by tables and charts of rates, because of the great variety of articles

comprised in ocean traffic, and because of the large number of ocean routes. The British Board of Trade in 1904 collected data regarding ocean-freight rates for numerous articles imported into Great Britain from North America, South Europe, the Indian Ocean, and Australasia, and for commodities exported from Great Britain to Canada and the United States, the North Sea and Baltic countries, South Europe, South America, and Australasia. From these detailed rates there was calculated the mean annual freight rate on ocean traffic for each of the twenty years from 1884 to 1903 inclusive. By taking the average or mean rate for 1900 as the basis of comparison, and calling that rate 100 per cent, and by expressing the average rates for the other years in percentages of the rate for 1900, the fluctuations in rates for the twenty years were shown by the Board of Trade in tabular form




Fluctuations in Ocean Freights, 1884–1903.

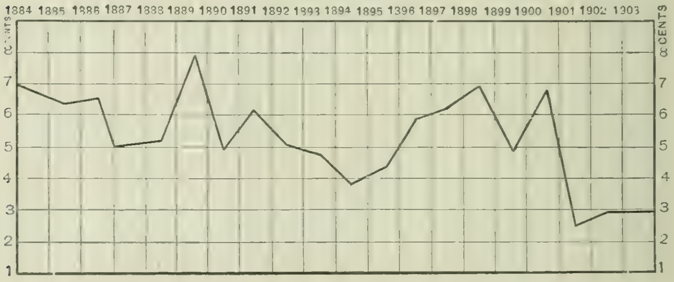
Chart Showing the Percentage Fluctuations in Mean Yearly Freight Rates in Certain Trades and Voyages. (1900 figure equals 100 per cent.)

Inward Freight Rates ——— Outward Freight Rates. - - - - - -

as on page 184. The fluctuations in wholesale prices are also shown in the table, and it will be seen that ocean rates have varied through a wider range than general wholesale prices have.

The facts contained in the table on page 184 are charted in the report of the Board of Trade on page 185.

In discussing the data presented in the table and chart, the report of the Board of Trade states, "that subject to minor fluctuations, due doubtless to the special conditions prevailing in particular trades from time to time, the trend of inward and outward freight rates as a whole has been generally similar. In both cases the maximum year of the period was 1889, a time of great commercial activity throughout the world. Thence freight rates declined until the year 1895 or 1896, after which they recovered until a second maximum point was reached in 1900, a year when trade was very good, and when the South African War made great demands on shipping for transport purposes. It will be seen that inward freight rates show an intermediate maximum point in 1898, the year of the Spanish-American War. After 1900 there was a collapse of freight rates, the figures for 1902 both for inward and outward freights being lower than in any other year of the series. The rates in 1903 were slightly higher than in 1902."



The mean annual ocean rates per bushel by steamship on grain (wheat) from New York to Liverpool for the twenty years ending with 1903 may be charted as on the foregoing page. The mean annual steamship rates from New York to Liverpool on grain, flour, beef, and pork, from 1884 to 1903 inclusive, were as follows:

| YEAR. | CLASS OF GOODS. | | | |
|---|---|---|---|---|
| | Grain. | Flour. | Beef. | Pork. |
| | SCALE. | | | |
| | Per bus.[1] | Per ton.[1] | Per tierce.[1] | Per bbl.[1] |
| | cts. | | cts. | cts. |
| 1884 | 7.02 | $3.05 | 89.9 | 75.4 |
| 1885 | 6.40 | 2.76 | 77.4 | 59.1 |
| 1886 | 6.62 | 2.82 | 77.9 | 63.1 |
| 1887 | 5.04 | 2.22 | 63.6 | 51.6 |
| 1888 | 5.28 | 2.32 | 71.1 | 52.1 |
| 1889 | 7.88 | 3.33 | 105.2 | 76.4 |
| 1890 | 4.94 | 2.44 | 81.4 | 61.1 |
| 1891 | 6.28 | 2.73 | 95.4 | 63.1 |
| 1892 | 5.22 | 2.48 | 69.6 | 45.8 |
| 1893 | 4.70 | 2.26 | 69.6 | 49.1 |
| 1894 | 3.82 | 1.89 | 58.6 | 42.3 |
| 1895 | 4.32 | 1.88 | 53.6 | 35.3 |
| 1896 | 5.88 | 2.61 | 72.1 | 50.1 |
| 1897 | 6.18 | 2.74 | 68.1 | 48.6 |
| 1898 | 6.92 | 3.34 | 86.4 | 64.1 |
| 1899 | 4.84 | 2.55 | 66.8 | 49.1 |
| 1900 | 6.80 | 3.07 | 87.9 | 65.6 |
| 1901 | 2.48 | 1.44 | 36.3 | 28.3 |
| 1902 | 2.92 | 1.80 | 47.3 | 35.8 |
| 1903 | 2.92 | 1.82 | 50.6 | 46.8 |

[1] Rates compiled from the yearbooks of the New York Produce Exchange.

The ocean-freight service to-day is far superior to the service of fifty or twenty-five years ago. Traffic is carried at greater speed and with less risk. Refrigeration has included perishable articles in the list of the commodities exchanged in international commerce. Special types of vessels have been introduced to handle oil, ore, fruit, and other commodities whose transportation can be facil-

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itated by using ships adapted to the peculiar needs of particular kinds of traffic. Some improvements in the ocean-freight service have made the service more expensive; but the improvements that have reduced expenses have been of greater effect, and the present excellent service of ocean-freight transportation is performed at lower average rates than formerly prevailed.

### REFERENCES FOR FURTHER READING

SMITH, J. R. "The Organization of Ocean Commerce," Chapter IV. "British and Foreign Trade and Industry." (2d Series.) Second Series of Memoranda, Statistical Tables and Charts, prepared in the Board of Trade with reference to various matters bearing on British and foreign trade and industrial conditions. (One section of this Blue Book is devoted to the "Course of Ocean Freights during the past twenty years." The charts and tables there presented contain a large amount of information.)

# CHAPTER XIV

## MARINE INSURANCE

Ocean transportation and the business of international commerce could not have reached their present high state of development without the aid of marine insurance, whereby the risks of losses at sea are taken from the individual owner of property afloat and distributed among numerous individuals or corporations. Unless men were able to minimize the risks of losing their property, they would hesitate to invest capital in ships; unless the merchant were able to insure his cargoes, he would not be able to engage extensively in international trade. Without marine insurance to relieve the merchant of risks, he would be obliged to limit trade to commodities upon which he could make large profits; but with the protection afforded by insurance, he can do business upon a narrow margin, can handle the great staples of present commerce as well as the luxuries which formerly characterized international exchanges. Insurance has enabled goods to be sold at lower prices than they could otherwise have been sold, and has thus helped to make possible the great development that has taken place in the world's maritime commerce.

The world's commerce is organized on the basis of an extensive system of international credits. Unless the elements of risk had been eliminated from the business of international trade the present extensive use of credit would be impossible. The marine insurance policy

always accompanies the bill of lading, and is as essential a factor of commercial credit as is the bill of lading.

Marine insurance might logically have been considered in Part II of this volume in connection with the discussion of the ocean transportation service; however, insurance may also properly be dealt with in this part of the book where the various relations of the carriers to the public are studied. Insurance constitutes one of the carrier's costs of performing the service of ocean transportation, and is consequently one of the necessary expenses of international commerce. Marine insurance is an essential feature both of the ocean transportation service and of the business of international trade.

Marine insurance covers the risks of loss of ship, cargo and freight charges. The business, as conducted to-day, originated about 1200 A.D., among the Lombard merchants of Northern Italy. Previous to that time persons having money to invest made loans to the owners of a vessel and its cargo upon the condition that the money, together with liberal interest, should be returned at the end of the ship's voyage. If the vessel and cargo were lost, the loan was not repaid. These transactions were called loans on bottomry, and differed radically from marine insurance, which consists of the payment in advance of a premium by the owners of ship or cargo in return for a guarantee on the part of the insurance company of the payment of all or a portion of the stipulated sum of money in case of the total or partial loss of the property invested in the ship or cargo.

Although marine insurance was generally practiced both in England and on the Continent long before Lloyd's Association of London originated, that association has had such an influence upon the development of marine insurance as to cause the name of Lloyd to be most closely identified with that form of insurance. A

brief account of Lloyd's will illustrate one of the two leading plans of marine insurance now followed by underwriters.

In the middle of the seventeenth century a London coffee house conducted by Edward Lloyd came to be a meeting place for merchants and seamen. Lloyd developed an extensive system of home and foreign correspondence, by which he was kept informed concerning the movements and condition of vessels engaged in ocean commerce in various parts of the world. He secured this information for his patrons, and, in consequence, his coffee house became the meeting place for underwriters who assembled there to carry on their business of marine insurance. Until 1692 Lloyd's Association was located in Tower Street, London; then it was removed to Lombard Street, and finally, in 1774, it occupied the Royal Exchange, which has since been the chief center of the business of marine insurance throughout the world.

Lloyd's Association, as its name implies, is composed of a group of men each carrying on marine insurance in an independent capacity. Each member of the association has a desk allotted to him, there being between 350 and 400 desks in the Royal Exchange, London. An insurance policy covering the vessel and its cargo is not underwritten by one person or firm, but by several; sometimes there are from 50 to 100 underwriters, who, however, are not bound together, but act independently, each person accepting for himself only as much of the risk as he may desire to assume. The method of doing business at the Royal Exchange in London is described as follows by Mr. Samuel Plimsoll:[1]

"The proposals of insurance are handed around by the insurance brokers' clerks all day long; these proposals, called slips, give the name of the ship, amount to

[1] *The Nineteenth Century,* vol. xxv. p. 329.

be insured, and rate per cent offered. Perhaps sixty or seventy of these slips, or even more, are laid before each underwriter daily. After reference to *Lloyd's List of Ships*, he either passes it on, or, if he decides to 'take a line' upon it, he subscribes or 'underwrites' his name, together with the amount he is willing to guarantee for at the rate specified; this varies much, and generally goes as low as £200 or £100, frequently £50, and sometimes even less than that—*never* an amount large enough to warrant his disputing his liability in case of loss."

The members of Lloyd's Association are kept informed regarding vessels to be insured by an intelligence department of the association, which has agents located in every part of the world for the purpose of forwarding information to London regarding the arrival and departure of vessels, wrecks, accidents, and all other facts affecting shipping. The information obtained from agents and shipmasters enables the association to issue five different publications:

1. *Lloyd's List*, which is the official daily publication of the association, and contains the shipping news as it is currently received.

2. *The Index*. A weekly paper containing a list of the vessels of the world, and the condition and location of each vessel according to the latest reports.

3. *Lloyd's Register of British and Foreign Shipping*. This is a large annual volume, which has been regularly published since 1834. This publication gives a description and rating of every vessel of importance employed in the world's commerce.

4. *A Register of Captains*, which is a biographical dictionary giving an account of the record of service and qualifications of the certified masters of British ships. The volume contains the record of about 25,000 men.

5. *A Record of Losses.* A volume that is often spoken of as the Black Book.

Although Lloyd's Association is more influential than any of its competitors, there are many rival insurance corporations in Great Britain; and the competition of these rival companies is gradually depriving Lloyd's Association of its undisputed leadership in marine insurance. It will, however, be some time before any rival company or association can hope to be as influential as Lloyd's now is.

The various underwriters in Great Britain now control three fourths of the marine insurance written in the entire world. Great Britain's control of marine insurance is even more overwhelming than is her position in the carrying trade of the world; nevertheless, other centers of marine insurance are developing, the most rapid growth in the business outside of England being enjoyed by Hamburg, Germany.

In the United States marine underwriting was formerly a very prosperous business, but with the decline of our tonnage the amount of marine insurance written in this country has fallen off. American marine insurance methods have differed slightly from those followed by the underwriters connected with Lloyd's Association, the business in this country being conducted mainly by corporations. The Lloyd system, although tried in the United States, has never flourished in this country.

The history of marine insurance in the United States shows how closely its success or decline is bound up with the prosperity and vicissitudes of our over-sea merchant marine. Three distinct periods in the history of marine insurance in the United States, are distinguishable:

1. Until 1794, such marine insurance as was written in America was carried by individuals or partnerships, and not by corporations. The first insurance office

opened by any individual in the American colonies seems to have been started in Philadelphia in 1721. The first office in New York was opened in 1759. The business done in Philadelphia, New York, and Boston, however, but partly supplied the demand for marine insurance in America. Most persons desiring to secure insurance were obliged to apply to the London underwriters.

2. The second period in the history of marine insurance in the United States began in 1794, at which time the General Assembly of Pennsylvania gave a charter to the Insurance Company of North America, a company that had been carrying on business without incorporation for two years. The example set by Pennsylvania in chartering this company led to the incorporation of numerous companies in Pennsylvania and other States. The fifteen years from 1790 to 1805 were years of prosperity for the American merchant marine and its development was accompanied by a rapid increase in the number of insurance companies. Thirty-two such companies were incorporated prior to 1800. These early years of prosperity were unfortunately followed by several years of heavy losses resulting from the destruction of American vessels during the years from 1807 to 1815, when the Napoleonic wars in Europe and our War of 1812-15 almost paralyzed the international carrying trade of American vessels.

With the restoration of peace in 1815, the American marine revived, but the insurance business was not immediately restored to prosperity, because of the unrestrained rivalry of the numerous companies engaged in underwriting. There was not enough business to enable the many insurance companies to prosper; indeed, it was not until 1840 that marine insurance business in the United States again began to flourish. Then followed twenty years of such rapid increase in marine underwrit-

ing that the two decades preceding the great Civil War constitute the golden age of marine insurance in the United States.

3. With the Civil War began the third period in the history of marine insurance in the United States—a period of steady and disheartening decline. The four years of the Civil War were a heavier strain than most insurance companies could bear; only the strong ones were able to survive the period of that conflict. Had the merchant marine engaged under the American flag in our foreign commerce been prosperous during the past forty years, marine insurance business would probably have flourished in the United States; but the tonnage of our over-sea shipping has dwindled to small proportions, and with its decline the business of marine underwriting in the United States has fallen off.

In addition to the causes just mentioned for the decline of marine insurance in the United States, there are two others that should be noted. (1) After the introduction of iron vessels on an extensive scale about the middle of the nineteenth century, Lloyd's Association gave iron vessels a higher rating than wooden ones. The effect of this was a discrimination in favor of British shipping, because of the fact that most of the iron vessels of the world were under the British flag. American shipping, until very recently, has consisted mainly of wooden vessels. Lloyd's higher rating for iron vessels may have been justified, but it has had an adverse effect upon the growth of marine underwriting in the United States, and upon the development of American shipping. (2) Foreign underwriters, prosperous at home, have competed against American underwriters with success for the business of insuring American shipping and commerce. In 1871 there was only one foreign company doing marine underwriting in New York city; three years later the

number of foreign companies had increased to seven; today there are only three American companies and fifteen foreign companies doing marine underwriting in New York. A few figures in regard to the amount of marine insurance business done in the United States will indicate the relative strength of the foreign and domestic companies.

During the year 1903 the total net marine risks assumed by all the foreign and domestic companies operating in the United States aggregated approximately $6,877,006,221; the net premiums received, nearly $18,000,000; and the admitted assets $112,912,000. According to Dr. Huebner more than one half of the total marine risks assumed by insurance companies in the United States during 1903 were underwritten by twenty leading foreign companies operating in the United States. The operations of the foreign companies are not confined to the Eastern States, nor to American ships engaged in the foreign trade, as is shown by the fact that foreign companies wrote 61.5 per cent of the insurance placed upon the vessels operating upon our Great Lakes in 1903. Our coastwise and foreign shipping operated from the Gulf ports of the United States secured 75 per cent of its insurance from British and German firms, and the situation on the Pacific coast was practically the same.

The American company doing the largest marine insurance business at the present time is the Atlantic Mutual, of New York city. This company was organized in 1842, and has devoted itself exclusively to the business of marine insurance. Most other American companies engaged in marine underwriting are also fire insurance companies; among the important marine and fire insurance companies being the parent of all insurance companies in America, the Insurance Company of North America, organized in Philadelphia in 1794; the Provi-

dence-Washington Company, organized in Providence, 1799; the St. Paul Fire and Marine Company, 1865; the Boston Insurance Company, 1873; and the Federal Insurance Company of Jersey City, 1901. There are twenty-six American fire-marine insurance companies, but only two of them do a larger marine than fire business. The figures for the entire business done by the companies engaged in marine insurance, or in both marine and fire insurance, show that those companies carry fire risks three times as great as their marine risks. The premiums they receive from their fire insurance are four times the premiums obtained from their marine business.

The facts just cited show that the business of marine underwriting in the United States has ceased to be prosperous, and that most American companies are able to engage extensively in marine underwriting only by combining that business with fire-insurance risks. Although the tonnage of American shipping engaged in the coastwise trade of the United States has steadily increased with the growth of our commerce, American marine underwriters have not been able to hold their own in competition with the British and German companies, whose business rests upon the safe foundation of a rapidly increasing national marine engaged in the foreign trade.

In connection with the progress of consolidation in the service of ocean transportation, there has arisen a tendency for the largest steamship companies to provide a system of self-insurance. The Hamburg-American Company, the North German Lloyd, the Peninsular and Oriental Steamship Company, and the International Mercantile Marine Company, are conspicuous instances of large companies that insure the greater part of their own shipping. Each of these companies establishes an insurance fund into which it pays annually the premiums it

would pay to insurance companies. The International Mercantile Marine Company, for instance, during the year 1903, paid into its insurance fund the sum of $2,100,523.

In the case of some companies it is the custom to insure the cargo as well as the ships. When this is done, the steamship company usually distributes the risks it carries on cargo among regular insurance companies. The tendency, however, is for the steamship companies to refrain from insuring cargoes, and to limit their insurance to the plan of self-insurance, covering only the vessels they own.

The marine insurance policy is defined by Mr. John Duer, in his work on the "Law and Practice of Marine Insurance," as a "contract of indemnity, in which the insurer, in consideration of the payment of a certain premium, agrees to make good to the assured all losses, not exceeding a certain amount, that may happen to the subject insured from the risks enumerated or implied in the policy, during a certain voyage or period of time." The contract, in order to be valid, must be undertaken in good faith by both parties, and all material facts affecting the obligations covered by the contract must be accurately stated by the purchaser of insurance, who must ordinarily possess an insurable interest in the subjects covered by the policy. This insurable interest usually, but not necessarily, implies ownership of the property insured; however, ownership is not absolutely essential, the courts having held that a person possesses an insurable interest if he can show that the destruction of the property insured would indirectly inflict a damage upon him or his property. Some companies write what are popularly called wager policies, which, as their name suggests, involve no insurable interest on the part of the insured. The wager policy usually contains such a clause as "interest or no

interest," or "policy proof of interest," modifying the terms of the ordinary insurance contract.

In his work on "Marine Insurance" Mr. William Gow summarizes the essential features of a marine insurance policy, by stating that the policy must (1) contain a contract of indemnity; (2) be made in good faith; (3) refer to a stipulated proportion of the property affected by the insurance; (4) must indicate that the insured has a genuine interest in the property covered by the contract; (5) that the insurance is against contingencies, definitely stated in the contract, to which the property insured is exposed; and (6) that the insurance is afforded in return for a definite payment on the part of the insured.

The kinds of property covered by marine insurance policies are very numerous; consequently there are many types of policies, among which may be mentioned "vessel policies," "vessel and freight policies," "cargo policies," "steamboat policies only," "tug policies," "stranding or collision policies only," "lighterage policies," "yacht policies," "whaling and fishing policies," "canal hull polcies," "river cargo policies," "lake cargo and vessel policies," "cotton policies," "builders' policies," etc.

The marine insurance policies written to cover the above and other kinds of property vary in accordance with the nature of the risk assumed by insurance companies, and may accordingly be grouped into four classes:

The first class of policies includes those in which the value of the property insured is stated in the policy. Such a policy may be either "valued" or "open," a valued policy, as defined by Dr. Huebner, "being one which stipulates some agreed value (not necessarily the real value), such as $1,000 worth of goods or a ship worth $50,000; an open policy, on the contrary, being one which omits to specify the value of the subject in-

sured, but leaves this to be ascertained when a loss occurs. The only real difference between the two is, that in case of total loss, in the absence of fraud, the valued policy entitles the insured to receive the value specified in the policy without proving the loss, while the open policy makes necessary an adjustment as proof of the loss incurred. In case of partial loss, however, this difference does not exist, since the same adjustment must be made, irrespective of whether the policy is open or valued."

The second class of policies covers only vessels, and is characterized by the presence or absence in the policy of the name of the vessel covered by the insurance. Policies of this class may be either "floating" or "named." The significance of these terms is described as follows by Dr. Huebner: "By a floating policy is meant one which describes the limits of the voyage, the value of the property insured, and the type or class of vessel to be employed, but does not specify any particular vessel. The policy, in other words, is stated to apply to any 'ship or ships.' The wording is thus made sufficiently broad to enable a merchant to insure his goods before he is able to ascertain the name of the vessel on which they will be shipped, or to give him protection in case of loss before he is able to make a specific insurance. As soon, however, as the name of the vessel employed on the voyage becomes known to the insured, this information, together with any important attending facts, is 'declared' to the underwriter and 'indorsed' on the policy, thus making his a 'named' policy instead of a 'floating' one."

The third class of policies comprises those insuring against loss within a stipulated period of time. Such policies may be either "voyage" or "time," which terms sufficiently explain themselves.

The fourth class of policies is the "interest policy,"

or "one clearly indicating that the insured possesses a true and substantial interest in the subject-matter of the insurance." In contrast with the interest policy is the wager policy already described. Such a contract as is made in the wager policy is not valid, and would not be upheld by courts in the United States. Such policies have been declared void by statute in England, but they continue to be written to a limited extent.

The losses covered by these different classes of policies are of three general kinds: (1) Losses occasioned by fire on shipboard or caused by the "perils of the sea," including all unavoidable damage to property caused by the elements or resulting from inevitable accidents; (2) jettison, or the throwing overboard of a part of the cargo or casting away of masts, spars, rigging, or fittings of the ship for the purpose of lightening or relieving the ship in case of storm or accident, and barratry or knavery on the part of the master or masters and crew; and (3) losses to ship and cargo caused by enemies, or pirates, or men-of-war.

The phraseology by which the several losses covered by a marine insurance policy are described is copied from Lloyd's form of policy, and the quaint language shows that a long and interesting history lies back of the present marine insurance contract. The clause in Lloyd's reads as follows: "Touching the adventures and perils which the said . . . Insurance Company is contented to bear, they are of the seas, men-of-war, fires, enemies, pirates, rovers, thieves, jettison, letters of mart and countermart, reprisals, takings at sea, arrests, restraints and detainment of all kings, princes, or people of what nation, condition, or quality soever, barratry of the master and mariners, and all other perils, losses, and misfortunes that have or shall come to the hurt, detriment, or damage of the said vessel (or goods) or any part thereof."

Marine insurance protects the insured against losses of many forms. The chief kinds of liability assumed by the marine underwriter may be indicated by defining four terms:

1. The protection afforded may be against "actual total loss" or "constructive total loss." When the object insured is totally destroyed, or is so much damaged as to be of practically no value to the insured, there is an "actual total loss." Sometimes it occurs, however, that the property insured, although slightly damaged, is so placed as to be of no further value to the insured. A stranded vessel may be but slightly damaged, and yet it may be necessary to abandon the ship, in which case the insured would give the insurer notice of abandonment, and his contract would enable him to secure the full amount of insurance; his loss would be a "constructive total loss."

2. The second form of liability which a marine insurer may have to meet is "general average." According to Dr. Huebner, "general average may be defined as covering all those losses which result from the sacrifice of any interest voluntarily made by the master of a vessel in time of distress for the common safety of the ship, cargo, and freight, and which must be repaid proportionately by all the parties benefited." It sometimes happens that a vessel is obliged to throw overboard part of its cargo in order to save the vessel and the remainder of the cargo. In such a case justice requires that all the parties carrying insurance upon the vessel and its cargo should share in the loss, that there should be a "general average" of the loss.

3. The liability assumed by the insurer may provide for the payment of losses by "particular average." When the property insured is damaged by accident, and is not destroyed by the master of the vessel for the sake of saving

# By the Atlantic Mutual Insurance Company. [No. ____________ ]

ON ACCOUNT OF ____________

In case of loss to be paid in funds current in the United States, or in the city of New York, to

Do make insurance, and cause to be insured, at and from

the day of 190 , at noon, until the day of 190 , at noon,

if on a passage on the expiration of the term, with liberty to the assured to renew the Policy for one, two or three months, at the same rate of premium, if application be made to the Company on or before the expiration of the first term. The risk, however, is to terminate at any port at which she may first arrive during the said extended time, on her being moored therein twenty-four hours in good safety, a pro rata premium to be returned for each entire month not entered upon of the extended time, there being no loss or other claims made. Warranted not to use ports on the Continent of Europe north of Hamburg, between 1st November and 1st March; nor the Gulf of or River St. Lawrence, except between the 1st of June and 15th of September; nor foreign ports and places in the Gulf of Mexico, nor ports or places on the West coast of America north of Puget Sound during the period insured; nor to load more than her registered under deck tonnage capacity with lead, marble, coal, and or iron, on any one passage; (excepting on coastwise passages between Atlantic ports of the United States). Each passage subject to separate average.

SPECIMEN

AND IT IS FURTHER AGREED, that if the vessel hereby insured shall in consequence of collision with another vessel, become liable to pay, and shall pay, any sum or sums for damages resulting therefrom to said other vessel, her freight or her cargo, in such case this Company will contribute towards the payment of three-fourths of the total amount of said damages, in the proportion that the sum insured under this policy bears to the total valuation of the vessel as stated herein, provided that this Company shall not in any event be held liable under this agreement for a greater sum than three fourths of the amount insured under this Policy.
AND IT IS ALSO AGREED that this Company will bear a like proportionate share of the costs and expenses that may be incurred in contesting the liability resulting from said collision, provided the written consent of the Company to such contest be first obtained.
But under no circumstances shall this Company be held liable for any contribution in respect of any sum that the assured may be held liable to pay, by reason of loss of life or personal injury to individuals in any cause whatsoever.

upon the body, tackle, apparel and other furniture,

of the good ____________ called the ____________
whereof is master for this present voyage, or whoever else shall go for master in the said vessel, or by whatever other name or names the said vessel, or the master thereof, is or shall be named or called.

**Sum Insured,**

$

**And** it shall and may be lawful for the said vessel, in her voyage, to proceed and sail to, touch and stay at, any ports or places, if thereunto obliged by stress of weather or other unavoidable accident, without prejudice to this insurance. The said vessel, tackle, etc., hereby insured, are valued at

without any further account to be given by the assured, to the assurers, or any of them, for the same.

**Touching** the adventures and perils which the said **Atlantic Mutual Insurance Company** is contented to bear, and takes upon itself in this voyage, they are of the *seas, men-of-war, fires, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, reprisals, takings at sea, arrests, restraints and detainments of all kings, princes or people of what nation, condition or quality soever, barratry of the master and mariners,* and all other perils, losses and misfortunes, that have or shall come to the hurt, detriment or damage of the said vessel, or any part thereof. AND in case of any loss or misfortune, it shall be lawful and necessary to and for the assured, factors, servants and assigns, to sue, labor and travel for, in and about the defence, safeguard and recovery of the said vessel, or any part thereof, without prejudice to this insurance, to the charges whereof, the said Insurance Company will contribute according to the rate and quantity of the sum herein insured, nor shall the acts of the insured or insurers, in recovering, saving and preserving the property insured, in case of disaster, be considered a waiver or an acceptance of an abandonment; having been paid the consideration for this insurance, by the assured or assigns, at and after the rate of

Warranted by the assured free from claim on account of capture, seizure, detention or destruction by or arising from hostile forces, civil commotions, riots, or by the acts of officers or other persons acting in the name of belligerents, or in pursuing warlike operations whether before or after declaration of war.

**And** in case of loss, such loss to be paid in thirty days after proof of loss, and proof of interest in the said (the amount of the Note given for the premium, if unpaid, being first deducted), but no partial loss or particular average shall in any case be paid, unless amounting to *five per cent.* PROVIDED ALWAYS, and it is hereby further agreed, That if the said assured shall have made any other assurance upon the premises aforesaid, prior in day of date to this policy, then the said ATLANTIC MUTUAL INSURANCE COMPANY shall be answerable only for so much as the amount of such prior assurance may be deficient towards fully covering the premises hereby assured; and the said ATLANTIC MUTUAL INSURANCE COMPANY shall return the premium upon so much of the sum by them assured, as they shall be by such prior assurance exonerated from. AND in case of any insurance upon the said premises, subsequent in day of date to this policy, the said ATLANTIC MUTUAL INSURANCE COMPANY shall nevertheless be answerable for the full extent of the sum by them subscribed hereto, without right to claim contribution from such subsequent assurers, and shall accordingly be entitled to retain the premium by them received, in the same manner as if no such subsequent assurance had been made. Other insurance upon the premises aforesaid, of date the same day as this policy, shall be deemed simultaneous herewith, and the said ATLANTIC MUTUAL INSURANCE COMPANY shall not be liable for more than a ratable contribution in the proportion of the sum by them insured to the aggregate of such simultaneous insurance. IT IS ALSO AGREED, that the property be warranted by the assured free from any charge, damage or loss, which may arise in consequence of a seizure or detention, for or on account of any illicit or prohibited trade, or any trade in articles contraband of war. AND it is further agreed, That in case a total loss shall be claimed, for or on account of any damage or charge to the said vessel, the only basis of ascertaining her value shall be her valuation in this policy; and if not valued herein, then her actual value at the time of the inception of this risk at the port to which she then belonged. AND LASTLY, it is agreed, that if the above vessel, upon a regular survey, should thereby be declared unseaworthy, by reason of her being unsound or rotten, or incapable of prosecuting her voyage on account of her being unsound or rotten, then the assurers shall not be bound to pay their subscription on this Policy.

**Premium**

$

Warranted not to abandon in case of capture, seizure, or detention, until after condemnation of the property insured, nor until ninety days after notice of said condemnation is given to this Company. Also warranted not to abandon in case of blockade, and free from any expense in consequence of capture, seizure, detention or blockade; but in the event of blockade, to be at liberty to proceed to an open port and there end the voyage.

Proof of loss to be authenticated by the Agent of the Company, if there be one at the place such proofs are taken.

**In witness whereof,** the President or Vice-President of the said **Atlantic Mutual Insurance Company** hath hereunto subscribed his name, and the sum insured, and caused the same to be attested by their Secretary, in **New-York**, the day of one thousand nine hundred and

If the voyage aforesaid shall have been begun and shall have terminated before the date of this policy, then there shall be no return of premium on account of such termination of the voyage.

In all cases of return of premium, in whole or in part, *one-half per cent.*, upon the sum insured, is to be retained by the assurers.

Warranted by the assured not to use any of the Guano Islands, nor to load Lime under deck.
In case of claim for loss or damage, a deduction of one-third from the cost of repairing or replacing the same shall be made, after deducting the value of the old materials, except in the case of anchors, and of sheathing of copper or other metal; a deduction of one-fourth from the expense of repairing or replacing the metal sheathing, or any part thereof, (after first deducting the value of the old metal and nails), shall be made for every month since the vessel was last sheathed until the expiration of forty months, after which time the cost of re-metaling or repairing the same shall be wholly borne by the assured. If a technical total loss be claimed, similar deductions shall be made from the estimated repairs, and unless the net cost thereof would exceed a moiety of the insured value of the vessel, as expressed in this policy, after making such deductions, the loss shall be deemed partial only.

$ ____________

other property, the loss must be borne entirely by the company or companies that insured the particular property in question; the losses are not paid according to "general average," but by "particular average."[1]

4. The liability may be for the payment of salvage. Salvage is the reward granted by law to those who save life and property at sea. If a vessel in distress receives relief from another vessel and is towed to port, the vessel giving the assistance may claim salvage, and the amount legally due is payable by the company carrying the insurance on the vessel to which assistance was given.

Marine insurance is so large a subject that the foregoing pages have attempted to discuss only its main phases. In order to show in detail the provisions included in typical marine insurance policies, there are appended to this chapter a copy of Lloyd's form of policy, and a specimen of an insurance policy on a vessel. The vessel policy is one used by the Atlantic Mutual Insur-

[1] These two paragraphs relating to general and particular average contain only a brief definition of the subject. Space does not permit a discussion of the topic; but the following quotation from Dr. Huebner's essay on "Marine Insurance" will indicate the relation of "average" to that subject: "It should always be remembered that the liability for general average contribution and the right to claim it are matters which are entirely independent of marine insurance. If no insurance exists on any of the property involved, the respective owners must bear the contributions themselves. If, however, the property sacrificed is insured, then the underwriter becomes liable for the insured value, and by paying the same comes in possession of the right to receive the sums allowed in general average after deducting the contribution which applies to the interest he now represents. Moreover, if the contributing interests are insured, the underwriter is also liable for general average damage. But in determining the extent of his liability for such contributions the insured value of the property must be taken into account. If the insured value is equal to the value of the contributing interests, the underwriter pays all the general average contributions; but if it is less, he pays the contribution only in the proportion which the insured value bears to the contributory value."

ance Company, of New York, and is typical of the policies used by all American companies. Persons desiring to study the history and law of marine insurance in detail are referred to the works listed below.

REFERENCES FOR FURTHER READING

HUEBNER, S. "Marine Insurance in the United States." *Annals of the American Academy of Political and Social Science*, vol. xxvi, pp. 241–99. (Dr. Huebner's study is in two parts, the first part being concerned with the "Development and Present Status of Marine Insurance in the United States," the second part with "Policy Contracts in Marine Insurance.")

Upon the law of marine insurance many volumes have been written. Among those possessing merit may be mentioned "Marine Insurance," by William Gow; and "The Law and Practice of Marine Insurance," by John Duer.

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| S. G. | BE IT KNOWN THAT as well in own name as for and in the name of all and every other person or persons to whom the same doth, may, or shall appertain, in part or in all, doth make assurance and cause and them and every of them to be insured, lost or not lost, at and from |
| £ | |

upon any kinds of goods and merchandises and also upon the body, tackle, apparel, ordnance, munition, artillery, boat, and other furniture, of and in the good ship or vessel called the , whereof is master, under God for this present voyage, , or whosoever else shall go for Master in the said ship or by whatsoever other name or names the same ship, or the Master thereof, is or shall be named or called, beginning the adventure upon the said goods and merchandises from the loading thereof aboard the said ship, upon the said ship, her tackle, apparel, etc., and shall so continue and endure, during her abode there, upon the said ship, etc.; and further until the said ship, with all her ordnance, tackle, apparel, etc., and goods and merchandises whatsoever, shall be arrived at port of discharge as above and upon the said ship, etc., until she hath moored at anchor twenty-four hours in good safety, and upon the goods and merchandises until the same be there discharged and safely landed; and it shall be lawful for the said ship, etc., in this voyage to proceed and sail to, and touch and stay at any port or place whatsoever, without prejudice to this Insurance. The said ship, her tackle, apparel, etc., goods and merchandise, etc., for so much as concerns the assured, by agreement between the assured and assurers in this Policy, are and shall be valued at

Touching the adventures and perils which we, the Assurers, are contented to bear and do take upon us in this voyage, they are: of the seas, men-of-war, fire, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, surprisal,

taking at sea, arrests, restraints, and detainments of all Kings, Princes, and People, of what nation, condition or quality soever: barratry of the Master and Mariners, and of all perils, losses, and misfortunes, that have or shall come to the hurt, detriment or damage of the said goods and merchandises and ship, tackle, apparel, etc., or any part thereof; and in case of any loss or misfortune, it shall be lawful to the Assured, their factors, servants, and assigns, to sue, labour, and travel for, in and about the defence, safeguard, and recovery of the said goods and merchandises and ship, etc., or any part thereof, without prejudice to this Insurance; to the charges whereof we, the Assurers, will contribute each one according to the rate and quantity of his sum herein assured. And it is agreed by us, the Insurers, that this Writing or Policy of Assurance shall be of as much force and effect as the surest Writing or Policy of Assurance heretofore made in Lombard Street, or in the Royal Exchange, or elsewhere in London. And so we, the Assurers, are contented, and do hereby promise and bind ourselves, each one for his own part, our heirs, executors, and goods, to the Assured, their executors, administrators, and assigns, for the true performance of the premises, confessing ourselves paid the consideration due unto us for this Assurance by the Assured at and after the rate of

In Witness whereof we the Assurers have subscribed our names and sums assured in

(*Signatures of the Underwriters*) ________________

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**N. B.—Corn, fish, salt, fruit, flour and seed are warranted free from Average, unless general, or the ship be stranded: sugar, tobacco, hemp, flax, hides and skins are warranted free from Average under Five Pounds per cent.; and all other goods, also the ship and freight, are warranted free from Average under Three Pounds per cent., unless general, or the ship be stranded.**

# PART IV

# GOVERNMENT AID AND REGULATION OF OCEAN COMMERCE AND TRANSPORTATION

# CHAPTER XV

## AID AND REGULATION BY THE NATIONAL GOVERNMENT

The ocean carrier and the service he performs have for centuries been the special concern of every country with a seaboard and ocean ports. The ocean being the avenue of international intercourse, the highway connecting the home country with its colonies and dependencies, the theater of naval struggles epoch-making in the life of nations and in the survival or downfall of types of civilization, every progressive country having maritime boundaries is solicitous that its shipping interests shall prosper. Some countries have succeeded, and others have failed, in their efforts to maintain and augment their position on the sea; but every country whose lands reach the sea has sought, each in its own way, to establish conditions that will enable its people to seek wealth from the sea, and to carry the flag and prestige of the country beyond the narrow confines of its land domain.

The great nations of history have usually, though not always, been those that have responded to the call of the sea. The Phœnicians, the Greeks, the Venetians, the Norsemen, the Spanish and Portuguese, the Dutch, and the English of Great Britain and America, are examples of people that have made the sea as well as the land their home, and have thereby gained a large place in the world's history. The relation of the sea to the development of national greatness has, moreover, become far more important to-day than it has been in past centuries.

The ocean cable, the steamship, the enormous volume of international trade, the efficiency of the modern naval fleet, the possibilities of deciding the issues of war by naval conflicts, are causing Great Britain, Germany, France, and the United States, Japan, and other progressive powers, to give more and more attention to their commercial and shipping facilities and the strength and efficiency of their naval forces.

In each country the Government's relation to ocean transportation consists both of giving aid and of enforcing regulations. Methods and policies vary with different countries, each Government seeking to accomplish its aims by methods of its own.

The purposes of Government regulation of ocean transportation differ from those underlying public regulation of railroad transportation. The railroad service is one in which unrestrained competition tends to produce unreasonable and inequitable discriminations among persons and among places; and if competition be controlled by coöperation or combination of railway companies, the public may need protection against charges that are unreasonably high as well as relatively unjust; accordingly the public regulation of railroad transportation is primarily, although by no means exclusively, a question of controlling or adjusting rates and fares. On the contrary, the public regulation of ocean transportation does not attempt to control or adjust freight and passenger charges. The service of ocean transportation is so highly competitive that neither exorbitant charges nor arbitrary discriminations between places are possible. Moreover, it would probably be impossible for any country to regulate the charges of ocean carriers, because the service is international, and the vessels employed in the service are registered under many flags.

Governments regulate shipbuilding and ocean trans-

portation in order to protect the lives and property of passengers and shippers, to safeguard the welfare of seamen, to insure the use of harbors and port facilities by all shippers and ocean carriers under terms equitable to all parties, to police the harbor, and to enforce such quarantine regulations as the public health may require. In all particulars, except rates and fares, the ocean transportation service is subject to detailed public supervision and control; the charges for the service are regulated by competition, and every country, by making its ports open to all carriers on equal terms, insures the perpetuation of competition.

Government aid is given to those interested in shipbuilding and ocean transportation for economic and military reasons. By fostering its shipping interests each country hopes to increase its foreign trade, develop thereby its domestic industries and trade, and thus promote its general economic progress. Moreover, a strong merchant marine makes easier, if, indeed, it does not alone make possible, the development of a powerful navy. The needs of the navy always constitute one of the strong arguments in favor of liberal aid to merchant shipping.

In the United States, Government assistance is given to ocean transportation in four general ways: (1) The Government improves or constructs harbors, and either directly administers, or supervises the administration of, terminal facilities. (2) It takes various measures to increase the safety of navigation. (3) It seeks to make the service profitable, by giving American ships liberal payments for carrying our foreign mails, by reserving coastwise and domestic traffic to American vessels, and by various other means. (4) It aids the shipbuilding industry by admitting to American registry vessels built only in the United States; by allowing our builders to import

free of duty materials used in ship construction, and by requiring the domestic trade to be carried in American ships. The efforts of our Federal Government to make ocean transportation profitable when carried on under the American flag, and to build up a strong shipbuilding industry in the United States, have not been very successful. The policy of our Government, and of other countries, toward shipbuilding and the merchant marine, will be considered at some length in later chapters.

State governments and municipalities, as well as the Federal Government, participate in the work of aiding and regulating ocean commerce. This exercise of power by three different authorities makes the American system of aiding and regulating ocean transportation relatively complex, and a description of the system unavoidably somewhat detailed. The activities of the Federal, State, and city governments will be described in turn.

Although this volume is concerned primarily with transportation as distinguished from commerce, the following discussion of Government aid and regulation includes the relation of the Government to ocean commerce as well as ocean transportation. To aid transportation is to facilitate commerce; to increase commerce is to enlarge the business of the carrier; to regulate either one is to influence the other; accordingly, it has seemed best not to attempt to confine this and the two following chapters solely to ocean transportation.

The powers of the Federal Government over commerce, and its activity in aiding and regulating ocean transportation, are greater than those of the States and cities, and it exercises its authority through a confusing number of departments and bureaus. It will be best to name these branches of the United States Government, and to explain briefly what service is performed by each of these agencies.

## DEPARTMENTS AND BUREAUS OF THE UNITED STATES GOVERNMENT CONCERNED WITH AIDING AND REGULATING SHIPBUILDING, MARITIME COMMERCE, AND OCEAN TRANSPORTATION

1. The War Department:
   - Corps of Engineers of the United States Army.
2. Department of Commerce and Labor:
   - Lighthouse Board.
   - Coast and Geodetic Survey.
   - Bureau of Fisheries.
   - Fur-Seal and Salmon Fisheries of Alaska.
   - Steamboat Inspection Service.
   - Bureau of Navigation.
   - Bureau of Immigration.
   - Bureau of Manufactures.
   - Bureau of Standards.
   - Bureau of Statistics.
   - Bureau of the Census.
3. The Treasury Department:
   - Customs Service.
   - Revenue Cutter Service.
   - Life-Saving Service.
   - Public Health and Marine Hospital Service.
4. The Department of Agriculture:
   - United States Weather Bureau.
5. Navy Department:
   - Hydrographic Office.
   - Inspection of Vessels Awarded Contracts for Carrying Ocean Mails.
6. Post-Office Department:
   - Division of the Foreign Mails.
7. The State Department:
   - United States Consular Service.
   - Bureau of Trade Relations.
8. Department of Justice:
   - Enforcement of Laws of the United States.

Eight of the nine departments of the executive branch of the United States Government have to do with our maritime interests, the Department of the Interior being the only one not included in the above table. The Department of Commerce and Labor touches those interests at more points than any other department does, but the War and Treasury Departments have a no less vital connection with ocean commerce and transportation.

The Corps of Engineers of the United States Army, acting under the Chief of Engineers and the Secretary of War, has charge of river and harbor improvements. The construction of breakwaters, the excavation of channels, the dredging of harbors, the establishment of harbor lines marking the limit beyond which piers and wharves may not be extended within harbors, and all other necessary engineering work connected with laying out, improving, and maintaining harbors, come under the Secretary of War and the United States Engineers. Upon the basis of surveys, estimates, and recommendations made by the Chief of Engineers, Congress appropriates money for the improvement of harbors, and the work is executed under the supervision of Army Engineers.

The Department of Commerce and Labor has eleven Bureaus, or divisions of its activity, connected more or less closely with ocean commerce and transportation. This, the youngest of the nine executive departments that have thus far been established, was created by Congress, February 14, 1903, "to foster, promote, and develop the foreign and domestic commerce, the mining, manufacturing, shipping, and fishery industries, the labor interests, and the transportation facilities of the United States." To carry out this extensive programme of Government aid and supervision, Congress created two new bureaus—the bureaus of "Corporations" and "Manufactures"—and transferred to the department various

bureaus, boards, and "services" that had previously been subject to some other department, or had been without a departmental connection.

The Lighthouse Board has charge of a service that antedates the work of any other division of the Department of Commerce and Labor. August 7, 1789, Congress took over from the States the eight lighthouses that were then in existence, and placed them under control of the Secretary of the Treasury, who continued to be responsible for our lighthouses until the Department of Commerce and Labor was established in 1903. Since 1852 the Lighthouse Board as now constituted has had charge of the "Lighthouse Establishment." The board consists of "two officers of the navy, of high rank, two officers of the corps of engineers of the army, and two civilians of high scientific attainments." The board elects its own chairman; but "the Secretary of Commerce and Labor shall be *ex-officio* president of the Lighthouse Board." The law requires that the board "shall discharge all administrative duties relating to the construction, illumination, inspection, and superintendence of lighthouses, light-vessels, beacons, buoys, sea marks, and their appendages." The country is divided into districts, with an inspector in charge of each district. The board has charge of lighting and marking the channels leading to harbors, and of marking the channels of our larger navigable rivers, as well as of the lighthouses along the shores of the ocean and the Great Lakes.

The Coast and Geodetic Survey supplements the work of the Corps of Engineers and of the Lighthouse Board by preparing charts of the seacoast and of the adjacent ocean. Authorized by Congress in 1807, the "Coast Survey" was continuously connected with the Treasury Department until 1903, when it was placed under the Secretary of Commerce and Labor. Prior to 1836 it was

twice under the Secretary of the Navy for a short time. The present organization of the service dates from 1843; the title "Coast and Geodetic Survey" was first employed in 1878. The chief administrative officer of the Coast and Geodetic Survey is the Superintendent; the principal office is at Washington, and there are suboffices at San Francisco and Manila in charge of assistants to the superintendent. The law requires that "officers of the army and navy shall, as far as practicable, be employed" . . . "The officers of the navy to be employed on the hydrographical parts, and the officers of the army on the topographical parts of the work."

The maps prepared by the Coast and Geodetic Survey show with great detail and accuracy the coast line, the location of shoals and bars, the depth of the sea near the shore, the location of all channels and of all lighthouses and buoys, the location and direction of all currents, the variation of the magnetic needle; in fact, the maps aim to give the mariner all the information he needs to enter and clear our ports, to navigate our coasts, and to fish on the banks off the coasts of the United States and British America. The work of the survey is not confined to the shores of the United States, but has covered the Pacific coast from San Diego to Panama, the Hawaiian Islands, Alaska, and now includes the coast of Porto Rico and the Philippines. Surveys have also been made of parts of the coasts of Brazil, Cuba, and China; the purpose of the survey being to make, as far as possible, all the maps required for the safety of American shipping. The charts prepared by the Coast and Geodetic Survey are "sold at the cost of printing and paper."

Ocean commerce is indirectly aided, and the business of ocean transportation is increased, by the aid given to our maritime fishing industry by the Bureau of Fisheries now in the Department of Commerce and Labor. The

office of Commissioner of Fish and Fisheries was created by Congress in 1871, and the office was an independent branch of the Government service until 1903, when it became a bureau of the Department of Commerce and Labor. The bureau studies the life history and food of the leading varieties of fish, stocks the lakes, streams, and coastal waters with young fish, and seeks to improve the methods and apparatus of the fisheries industry. The bureau also "conducts investigations regarding the fur-seal herds of the Pribilof Islands and the Bering Sea." "At two points on the Atlantic coast are well-equipped marine biological stations. At various points throughout the country are thirty-six fish-cultural establishments. In the distribution of the output of the fish and eggs, five specially constructed railroad cars are used. There are also employed two seagoing steamers and one large seagoing schooner, as well as two smaller steamers and seven steam launches for river work. One of the steamers is especially equipped and adapted for deep-sea investigations."

The fur-seal and salmon fisheries of Alaska are not under the control of the Commissioner of Fish and Fisheries, but are under the direct supervision of the Secretary of Commerce and Labor, who appoints four agents to oversee the seal fisheries; and the President appoints two agents annually to visit, under the direction of the Secretary of Commerce and Labor, "the Alaskan salmon fisheries and canneries, to enforce the laws and regulations and report thereon."

The fishing industry is important not only because it affords a livelihood for those engaged in it, and contributes to the general food supply of the country, but also because it is an industry that develops hardy seamen, and enables the merchant fleet and the navy to secure men for their crews more readily than they otherwise could. During the days of the maritime greatness of the

United States the American fisheries were a large industry, and now that we are again turning to the sea, there are special reasons why we should seek to perpetuate and strengthen our fisheries.

The three bureaus of the Department of Commerce and Labor most concerned with the regulation of shipping and ocean transportation are the Steamboat-Inspection Service, the Bureau of Navigation, and the Bureau of Immigration.

The chief work of the Steamboat-Inspection Service is explained by the title of the bureau. The service dates from 1838, and its duties have been enlarged by numerous subsequent laws, until it is now charged with the duty of making an annual inspection of the hulls of steamers and sailing vessels, of inspecting the materials used in the boilers manufactured for steamships, of testing such boilers before they may be used, of licensing the officers of steamers, of inspecting passenger steamers to decide how many passengers may safely and lawfully be carried, and to see that all laws to protect the lives of passengers and crew are complied with, of enforcing the laws regarding the transportation of explosives, and of establishing such regulations regarding the construction and operation of ships as the laws permit and as the safety of the public requires. There is a supervising Inspector-General, and there are ten supervising inspectors and numerous local inspectors. Previous to the establishment of the Department of Commerce and Labor the service was under the direction of the Secretary of the Treasury.

The Bureau of Navigation, now in the Department of Commerce and Labor, was transferred from the Treasury Department in 1903. This bureau, which is not to be confused with a bureau of the same name in the Navy Department, was created in 1884, and the Commissioner

of Navigation at the head of this bureau was "given plenary jurisdiction over the commercial marine and merchant seamen of the United States, so far as they are not subject, under the laws, to the supervision of any other authority." The numerous duties of the Commissioner of Navigation comprise the registering, enrolling, and licensing of American vessels, the measurement of vessels, the interpretation of the tonnage tax laws, the listing and describing of all American vessels, the issuance of "instructions to the collectors of customs in regard to the documenting of vessels and their clearance, entry, and movements, . . . and instructions in regard to the entry of vessels into ports subject to quarantine," the enforcement of the laws for the protection of seamen, and the publication of statistics relating to the merchant marine and the American shipbuilding industry. The law provides that the Commissioner of Navigation "shall also investigate the operations of the laws relative to navigation, and annually report to the Secretary of Commerce and Labor such particulars as may, in his judgment, admit of improvement or may require amendment."

Concisely stated, the Commissioner of Navigation keeps the public informed regarding the conditions and needs of the shipbuilding and shipping interests; he lists, measures, and documents vessels, aids the Treasury Department in enforcing the tonnage tax laws, and protects American seamen. To enable the Commissioner of Navigation to protect seamen, the Secretary of Commerce and Labor is authorized to appoint at each important American port a shipping commissioner, whose general duties are to keep a register of the men who may desire to engage as seamen, "to superintend their engagement and discharge in manner prescribed by law," to aid the masters of vessels in compelling the seamen, who have been engaged, to be on board ship at the agreed time, and

"to facilitate the making of apprenticeships to the sea service." At a port where there is no shipping commissioner these duties devolve upon the collector of the port.

The annual report of the Commissioner of Navigation is a most instructive document. The volume contains not only elaborate statistical information regarding our shipbuilding industry and the merchant fleet under the American flag, but also a careful discussion of the needs of our shipping interests and of the laws required for the promotion of the business of building and operating ships. The student of the controverted questions of maritime policy will find these annual volumes his best source of information.

The Bureau of Immigration, transferred from the Treasury Department to the Department of Commerce and Labor in 1903, has become of great importance to the people of the United States. As long as the number of immigrants was relatively small, and as long as they came mainly from northern Europe, the need of restrictive measures was not felt; but with the arrival in a single year of over a million foreigners, mainly from central and southern Europe, the United States has been obliged to protect itself by laws intended to shut out the paupers, criminals, and other objectionable persons borne to our shores by this rising tide of immigration.

Until 1891, the laws of the United States regarding immigrants were enforced by State officials "designated by the governors of the respective States, under the direction and control of the Secretary of the Treasury." The expenses incurred in this administration by State officials was met from the "Immigrant Fund" provided for by congressional appropriation. In 1891 Congress took the administration away from the States and put it under a Superintendent of Immigration, and in 1895 changed the title to Commissioner-General of Immigra-

tion, and made his office the Bureau of Immigration. At this time the Bureau of Immigration was also charged with the enforcement of the laws against alien contract labor. In 1900 the administration of the Chinese exclusion law was made one of the duties of the Commissioner-General.

The Bureau of Manufactures is a new office that was created when the Department of Commerce and Labor was established in 1903. It is the duty of this bureau "to foster, promote, and develop the various manufacturing industries of the United States, and markets for the same at home and abroad, domestic and foreign, by gathering, compiling, publishing, and supplying all available and useful information concerning such industries and such markets, and such other methods and means as may be prescribed by the Secretary or provided by law."

The Consular Division of the Bureau of Manufactures now secures commercial and industrial information from the consuls and publishes their reports. The Consular Service being under the State Department, all instructions to the consuls calling for reports are issued by the State Department upon the request of the Chief of the Bureau of Manufactures in the Department of Commerce and Labor. The instructions sent to the consuls are formulated in the Bureau of Trade Relations of the Department of State, and the consuls report to the Chief of the Bureau of Trade Relations, who has authority to edit these reports as he may deem wise for diplomatic or other reasons, and then to transmit to the Bureau of Manufactures "such information as pertains to the Department of Commerce and Labor."

The commercial and industrial information received from the consuls is given publicity by means of four publications: (1) "The Daily Consular and Trade Reports"; (2) "The Monthly Consular and Trade Reports"; (3)

an annual volume called the "Commercial Relations of the United States," consisting of the annual reports of the consuls, accompanied by a yearly review prepared by the Chief of the Bureau in charge of the consular reports; and (4) special volumes containing the reports sent in by the consuls upon some particular subject, in accordance with instructions from the State Department. Prior to 1903 these reports were published under the direction of the Bureau of Foreign Commerce in the Department of State; now they are issued by the Bureau of Manufactures of the Department of Commerce and Labor. The reports are prepared and published to aid our manufacturing, commercial, and shipping interests, by keeping them informed regarding the development of productive processes in foreign countries, and the opportunities for increasing our trade abroad.

Although the beginnings of our consular service go back to 1776, thus antedating the establishment of the Federal Government under the Constitution, the systematic and regular publication of the reports made by the consuls was not provided for by Congress until 1856. In 1842 Congress had made it the duty of the Secretary of State to lay before Congress annually the information obtained from the consuls, but adequate provision was not made for enabling the Secretary of State to perform this duty until 1856, when Congress created the office of Superintendent of Statistics, in the State Department. In 1874 the Statistical Office became the Bureau of Statistics, and in 1898 the title of the office was again changed, and named the Bureau of Foreign Commerce, in order to avoid confusing this bureau of the State Department with the Bureau of Statistics in the Treasury Department. In 1903 the Bureau of Foreign Commerce was consolidated with the Bureau of Statistics, which was transferred from the Treasury Department to the Department of

Commerce and Labor. At the same time the Bureau of Trade Relations was created in the State Department, to formulate instructions to consuls, and to receive their reports for transmission to the Department of Commerce and Labor.

Of the other bureaus mentioned in the table under the Department of Commerce and Labor, but brief mention need be made. The Bureau of Standards was created by Congress in 1901, having been preceded for nine years by the Office of Construction of Standard Weights and Measures, connected with the Coast and Geodetic Survey. The function of the Bureau of Standards is to promote the progress of engineering, manufacture, and commerce, by standardizing weights and measures, and by being "a source of information along scientific lines." "Two laboratories, suitably equipped for carrying on investigations and measuring instruments of all kinds," are located in the suburbs of Washington. The bureau staff consists of a director and a corps of physicists and chemists.

The Bureau of Statistics tabulates and publishes detailed statistics of the imports and exports of the United States, and of the entrances and clearances of vessels at our ports. The data for these tables are secured by the collectors of the ports in enforcing the tariff and navigation laws of the United States. The collection and publication of these statistics was authorized by Congress in 1820, and a Division of Commerce and Navigation was established in the Treasury Department. In 1866 this division became the Bureau of Statistics; since 1875 it has been intrusted with the publication of the statistics of internal commerce, other than by railroad, and since 1892 the statistics of imports and exports by railroad as well as by vessels have been included. The reports of the bureau now cover our entire foreign trade, the sta-

tistics of which are readily collected at our customs houses; but no systematic organization for collecting the statistics of our domestic water commerce has been provided for by Congress, hence the reports of the bureau regarding our domestic trade are incomplete. The bureau publishes an annual report in two quarto volumes, and also a monthly "Summary of Commerce and Finance," in which are included not only the statistical tables regarding our trade, but also monographs dealing in turn with various American industries, and with the industrial and commercial conditions of numerous foreign countries.

The Bureau of the Census, in the Department of Commerce and Labor, is the chief agency by which the United States Government collects and publishes statistics. It has been a permanent bureau only since 1902; prior to that time the Census Office had an intermittent existence, being recreated each ten years by Congress to take the decennial census. The decennial enumeration of population required by the Constitution has come by gradual enlargement of the scope of the census to include comprehensive social, industrial, and commercial statistics, accompanied by monographic texts interpreting the statistical tables, and presenting much historical and economic data. The Act of 1902, creating a permanent Census Office, provides, among other things, for the collection each ten years of the statistics of transportation by water, and for the collection of such additional statistics relating to transportation as Congress may from time to time require. It is probable that the Census Bureau will in time be intrusted with the publication of all the statistics of navigation, trade, and commerce, other than traffic by rail; because such a consolidation of the statistical work of the Government would add to the economy and accuracy of our official statistical work.

Although the Act of Congress of 1903 creating the Department of Commerce and Labor took away from the Treasury Department most of the bureaus having to do with commerce, there still remain under the Secretary of the Treasury four important bureaus concerned with the regulation and aid of ocean commerce. One of these four is the Customs Service, which affects ocean commerce more vitally than does any other bureau by which our foreign trade is regulated.

At each important port there is a collector, who has numerous responsible duties, including the appraisement of imports and the collection of the tariff duties, the collection of tonnage taxes on shipping, the enforcement of the various laws regarding the entrance and clearance of vessels, and the collection of the statistics of imports and exports, and of the tonnage of the vessels that enter and clear each port.

The formalities to be complied with by the master of a vessel before clearing from a port were described in the chapter on the Freight Service: the final permission to sail is given by the Collector of the Port, who issues the clearance papers after the master of the ship has made out or secured all the papers required by law. Upon entering a port, the master must first satisfy the State or National quarantine authorities, and then, before beginning to unload cargo, the master of the vessel "must present his clearance papers (from the port from which he sailed) and register to the Collector of the Port, who holds them, or a consul's receipt for them, until the ship is ready to depart. Thus the collector, the representative of the custom's authority, keeps the ship under his control during the whole of the time that cargo is being discharged and loaded." [1]

The Revenue-Cutter Service assists the customs offi-

[1] J. Russell Smith, "Organization of Ocean Commerce," p. 112.

cials in the enforcement of the revenue laws, aids the Department of Commerce and Labor in enforcing the navigation laws, assists vessels in distress, coöperates with and supervises the life-saving corps, supervises the construction of life-saving stations, and removes derelicts from the path of ocean commerce. In 1904 there were 40 vessels, including 14 vessels and launches for harbor service and 26 cruisers, in commission in the Revenue-Cutter Service, which covers the entire seaboard of the United States, the Bering Sea, Arctic Alaska, and parts of the waters of Hawaii. During that year the service rescued 24 people from drowning, took on board and cared for 47 persons, and gave aid to 1,217 persons on board of the 154 vessels in distress to which assistance was given. The Revenue-Cutter Service was organized in 1790, eight years before the Navy Department was created.

The Life-Saving Service dates from 1848, since which time it has steadily increased in the range and efficiency of its useful and humane work. In 1904 the establishment comprised 273 stations, including 196 on the Atlantic and Gulf coasts, 16 on the Pacific coast, 60 on the Great Lakes, and 1 at the Falls of the Ohio River. During the year the service gave assistance in 359 disasters to documented vessels and 411 disasters to small sailboats and rowboats. In these 770 disasters the lives of 3,328 persons were endangered; all but 50 of the vessels and boats were saved, and all but 34 persons were rescued. Assistance of more or less importance was also given to 291 other vessels. There were 103 persons not on board vessels who were saved from drowning, and "many lives and a large amount of property are annually saved by the warnings given by the patrolmen and station lookouts to vessels which are discovered running into danger. During the fiscal year there were 161 such cases reported,

148 of which were by night and 13 during the daytime, in thick weather."

Along the dangerous coasts the life-saving stations are only a few miles apart, and men patrol the coast during storms. The stations are connected, and "the lines are so connected with the commercial centers that telegraph and telephone facilities are available to underwriters and shipowners, and communication can be had when necessary with the lighthouses and offices of the Weather Bureau." Plans are now maturing whereby the life-saving stations will be connected by wireless telegraphy, and will be able to communicate with the revenue cutters, which are likewise to be equipped for wireless telegraphing.

The other service under the Secretary of the Treasury requiring notice is the Public Health and Marine Hospital Service, which was established by Congress in 1798. This service is in charge of a surgeon-general and a large surgical staff. There were, in 1904, twenty-two Government hospitals and 122 relief stations, the number being increased as necessary from time to time. The Public Health and Marine Hospital Service makes physical examinations of men for other branches of the Government service when requested to do so; its medical inspectors examine the immigrants, to enforce the immigration laws; it has officers in Naples, Quebec, Vancouver, Victoria, and China and Japan, to examine aliens leaving for our country. In the hospitals, 14,303 persons were treated in 1904, and there were 44,253 outpatients in 1904. The revenues from the tonnage taxes are used for the support of the Marine Hospital Service.

Although the several States can and do maintain health and quarantine establishments, the United States also has quarantine officers, under the Surgeon-General of the Public Health and Marine Hospital Service, at

forty stations on the Atlantic, Gulf, and Pacific coasts. Our Government also has quarantine stations at the principal ports of Porto Rico, Hawaii, and the Philippine Islands. At five Cuban ports, and at seven fruit ports of Central and South America, United States medical officers inspect vessels bound for the United States or our insular possessions. We also have officers stationed at La Guayra, Venezuela, Callao, Peru, and Guayaquil, Ecuador, who, together with the United States consuls at these ports, inspect vessels and sign bills of health of vessels leaving for the United States and for the ports of Colon and Panama. Whenever an epidemic breaks out in any part of the United States the National authorities offer to coöperate with the State health officers to check the disease. A good instance of this coöperation was afforded in 1905 at the time of the yellow fever epidemic in New Orleans and other Gulf ports.

As commerce brings into ever closer and more intimate connection all parts of the world, the necessity for guarding against the spread of diseases becomes increasingly strong. The more perfectly the public health officers can localize and control contagious and infectious diseases, the less suffering there will be from the diseases, and the less interruption there will be to the currents of domestic and international trade. The National Government, having authority throughout our country, is better able to deal with quarantine and health problems than the States are, and the tendency is for the States to turn over the quarantine administration to the United States.

The dangers to which shipping is exposed from storms have been largely reduced by the forecasts and storm warnings issued by the Weather Bureau, which since 1891 has been connected with the Department of Agriculture. The law of 1890 reorganizing the bureau provided that it "shall have charge of the forecasting of

weather, the issue of storm warnings, the display of weather and flood signals for the benefit of agriculture, commerce, and navigation, the gauging and reporting of rivers, the maintenance and operation of seacoast telegraph lines, and the collection and transmission of marine intelligence for the benefit of commerce and navigation." The Chief of the Weather Bureau states that of the various warnings issued by the Weather Service, "those of storms and hurricanes, issued for the benefit of marine interests, are the most important and pecuniarily valuable. Storm warnings are displayed at nearly 300 points along the Atlantic, Pacific, and Gulf coasts, and the shores of the Great Lakes, including every port and harbor of any considerable importance; and so nearly perfect has this service become, that scarcely a storm of marked danger to maritime interests has occurred for years for which ample warnings have not been issued from twelve to twenty-four hours in advance. The reports from the West Indies are especially valuable in this connection, as they enable the bureau to forecast with great accuracy the approach of those destructive hurricanes which, during the period from July to October, are liable to sweep the Gulf and Atlantic coasts. The sailings of the immense number of vessels engaged in our ocean and lake traffic are largely determined by these warnings, and those displayed for a single hurricane are known to have detained in port on our Atlantic coast vessels valued, with their cargoes, at over $30,000,000."

Masters or owners of vessels desiring information regarding expected weather conditions have only to apply to the nearest storm-warning displayman of the United States Weather Bureau, who is authorized to telegraph to a weather station for the information, without expense to the applicant. The observers at the coast stations coöperate with the Life-Saving Service, and there are

numerous instances of vessels or crews being rescued that would have been lost had not their need of assistance been discovered and reported by the weather observers.

The seacoast, the adjacent islands, and the floor of the ocean near the land are surveyed and charted by the United States Coast and Geodetic Survey, now a part of the Department of Commerce and Labor; but the oceans from shore to shore are charted at frequent intervals by the Hydrographic Office attached to the Bureau of Navigation in the Navy Department. Monthly charts are published covering the North Pacific and North Atlantic, and a weekly bulletin issued regarding the North Atlantic. These charts locate not only the fixed dangers to navigation, but also those that are shifting or temporary, such as ice floes and derelicts. As Dr. Smith says: "In addition to the floating obstructions, the chart for any particular month gives the track followed by a large number of storms that have occurred in that month in preceding years; the relative amounts of fog that may be expected in certain regions; the prevalent wind force and directions; the ocean currents; the variations of the magnetic needle from the true north; and, lastly, the exact routes to be followed by steamers and sailing vessels in making their various voyages across the ocean."

The data for these maps are secured mainly from the captains of the vessels, who, upon arrival at an American port, report to the officials of the Hydrographic Office the location of all obstructions passed on the voyage. Reports of the outbound voyages are now being cabled back to the United States from some foreign ports. The captains making voluntary reports receive free of charge such pilot charts as they may need; other persons may obtain the charts for the cost of the printing and paper.

The Hydrographic Office was created as a distinct bureau upon authority granted by Congress in 1842, when

the act was passed establishing a United States Naval Observatory and the Hydrographic Office. "In 1866 Congress authorized the establishment of a separate hydrographic office, to be attached to the Bureau of Navigation in the Navy Department, for the purpose of supplying nautical publications and information not only to vessels of the United States, but to navigators generally."

The Post-Office Department, through the Foreign Mail Service, assists, and to some extent regulates, the business of ocean transportation. The assistance given to ocean carriers by our post office was explained in a previous chapter, where it was pointed out that the United States, and practically all countries, pay ships of their own flag higher rates than they give vessels under foreign flags for carrying the ocean mails.

Before the Postmaster-General can make a contract, under the Act of March 3, 1891, with a company for carrying mails in vessels of the first, second, or third class, as they are defined in the law, the vessels must be inspected by a naval officer or constructor designated by the Secretary of the Navy. The law requires that the vessels of these classes "shall be constructed with particular reference to prompt and economical conversion into auxiliary naval cruisers, and according to plans and specifications to be agreed upon by and between the owners and the Secretary of the Navy." This law has given the Navy Department some regulative influence upon our merchant fleet; but the number of vessels carrying mails under this law is so small that the influence of the navy upon the construction of our mercantile vessels has been slight.

The Department of State comes into touch with commerce and ocean shipping through the Consular Service and the Bureau of Trade Relations, as explained above.

The American consuls are officers that the United States maintains in the leading seaports and commercial centers of foreign countries not only to promote our foreign trade, but also to assist in the enforcement of our revenue laws, to protect the rights of American seamen and vessel owners, and to assist our diplomatic officers in affording protection to the personal and property rights of American citizens who may be residing or traveling abroad. The instructions from the State Department to consuls regarding commercial reports are formulated by the Bureau of Trade Relations, which also receives the consular reports, as has been explained.

The Department of Justice is related to ocean commerce and transportation, as it is to all other economic interests, its duty being to assist the President and the Federal courts in the enforcement of the laws of the United States.

This brief description of the aid and regulation of ocean commerce and transportation by the Federal Government, and of the several agencies by which the aid is given and the regulation is exercised, shows that the United States has developed a comprehensive and, in many respects, a generous policy toward the maritime interests of the American people. The extent to which American shipbuilders and American shipowners have succeeded or failed to succeed under this policy, the causes of the retarded development of the shipbuilding industry in the United States, the reasons why the tonnage engaged in over-sea transportation under the American flag is disappointingly small, and the changes that have been proposed in our mercantile policy, will be considered in later chapters. Before taking up the discussion of national policy it will be best to study the powers and activities of the States and municipalities as regards the aid and regulation of ocean commerce and transportation.

REFERENCES FOR FURTHER READING

"Organization and Law of the Department of Commerce and Labor." Prepared under the direction of the Secretary. 1904. (A volume of 716 pages, containing the history and present law of the Department and each Bureau.)

Annual Reports of the Secretary of the Treasury.

"Laws of the United States Relating to Navigation and the Merchant Marine." 1903. (This compilation of laws is published each few years by the Commissioner of Navigation. The last issue was in 1903.)

Fairlie, John A. "The National Administration of the United States of America." 1905.

O'Connor, W. D. "The United States Life-Saving Service." "Appleton's Annual Cyclopædia, 1878."

The annual reports of several of the bureaus described in this chapter contain a great amount of valuable material. Special mention may be made of the Reports of the Commissioner of Navigation, the Superintendent of the Coast and Geodetic Survey, the Lighthouse Board, the Chief of the Weather Bureau, the Commissioner of Fisheries, and the Commissioner-General of Immigration. The reports of these and all other bureaus of the United States Government are printed as public documents, and may be obtained without cost by applying to the Senator or Congressman representing the applicant's State or district.

# CHAPTER XVI

## AID AND REGULATION BY THE STATE AND MUNICIPAL GOVERNMENTS

The power to regulate commerce with foreign nations, and among the States, is vested in the National Government by the Constitution, which also provides that "no State shall, without the consent of the Congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws," and also that "no State shall, without the consent of the Congress, lay any duty of tonnage."

These clauses seem very clear and definite; but a long line of decisions of the Supreme Court has been necessary to define the limits of Federal and State authority over commerce. At the time of the adoption of the Constitution each State in its own way was aiding and regulating commerce; and instead of immediately ceasing to exercise authority over interstate commerce, the States have abandoned commercial regulation gradually as the Federal Government has assumed the powers it possesses.

Fortunately for the development of the United States, the powers of Congress over interstate commerce were broadly interpreted by Chief Justice Marshall in 1824, in the celebrated case of Gibbons *vs.* Ogden (9 Wheaton, 1), in which the Supreme Court held that a vessel enrolled by the Federal Government to engage in coastwise interstate commerce could not be required to obtain a State license. It was held that the United States, and not the States,

could determine the condition under which interstate commerce may be carried on. Three years later, in Brown *vs.* Maryland (12 Wheaton, 419), the Supreme Court annulled a law of Maryland that imposed a license tax of $50 on importers of foreign articles. The Court argued that this was a tax, that it regulated international commerce, and was unconstitutional. The States cannot compel a vessel enrolled by the Federal Government to take out State registration papers. A law passed by Alabama in 1854, requiring special State registration, was held by the Supreme Court in 1860 (Sinnot *vs.* Davenport, 22 Howard, 227) to be unconstitutional.

A State may lay a tax on the property value of the vessels owned by its citizens. This tax, however, must be levied on the property of the ship, and not upon its enrolled or registered tonnage. In 1866 Alabama imposed a tax of $1 per ton upon all vessels operating upon the navigable waters within the State; but the Supreme Court in 1871 annulled the law (Cox *vs.* The Collector, 12 Wallace, 204). Nor can a State authorize a board of port wardens to impose fees upon ships entering its ports. In 1867, in Steamship Company *vs.* Port Wardens (6 Wall, 31), this point was decided by the Supreme Court. The State, furthermore, is without authority to impose an occupation tax upon shipping. Louisiana, in 1870, empowered New Orleans to levy a tax upon all persons pursuing any trade or profession, and the city placed a tax of $500 on persons or corporations owning and running towboats to and from the Gulf of Mexico. A man by the name of Cooper, owning two steam propellers, enrolled at New Orleans under the laws of the United States, refused to pay the tax, and he was sustained by the Supreme Court of the United States in 1884, for the reason that the State could not require a tax to be paid for the privilege of employing vessels in a manner author-

ized by the license of the United States (Moran *vs.* New Orleans, 112 U. S., 69).

These references to the more important decisions interpreting the powers of the National and State Governments to regulate interstate and foreign commerce show that the Federal power is plenary; that vessels enrolled by the United States for the coastwise trade cannot be burdened or restricted by State laws regarding registration, licenses, fees, or tonnage taxes. The State may tax ships as property at the port of registration, but it may tax commerce only to the extent that "may be necessary for the execution of its inspection laws."

The power to regulate includes the power to aid, and the United States Government has pursued a liberal policy in its harbor improvements. Before 1789 the States carried on such improvements as were made to the channels and harbor areas of the ports; and for some time after 1789 the States continued to execute these works, in accordance with plans approved by the National Government. To raise the funds to meet the expenses of harbor works, the State was permitted by Congress to levy tonnage taxes. For instance, Congress passed an act in 1806 enabling the Board of Port Wardens for the port of Philadelphia to impose a tax of four cents a ton on all vessels clearing from the port, the receipts of the tax to be used in improving the navigation of the Delaware River and in constructing piers. Congress began in 1822 to make regular appropriations for harbors; before that time Congress did little more than to maintain the lighthouses.

The large appropriations by Congress for the improvement of harbors began to be necessary about 1870, as the result of the use of vessels of deep draft. Since then ships have steadily increased in size, the volume of our maritime trade has grown rapidly, the number of our

seaports has become larger, and the expenditures required to modernize and maintain our harbors have risen year by year.

In 1905 there was much said in Congress in favor of requiring the States having the largest ports to share a part of the expense of harbor improvements. The appropriation of $500,000 made by Congress that year for the completion of the 30-foot channel in the Delaware River was made contingent upon an appropriation of $750,000 being made by the State of Pennsylvania. Half the $750,000 was furnished by the State Government, and the other half by the city of Philadelphia. Whether this dual plan of harbor improvements by National and State appropriations will become a permanent feature of our policy is uncertain; but if such should be the outcome, there will doubtless be a desire on the part of the States to be given authority to reimburse themselves by levies on shipping and commerce. It is not probable, however, that State taxes on commerce will find favor with the American people; and for this reason the general adoption of the plan of dividing the expenses of harbor improvements between the National and the State Governments is hardly to be expected.

Control over pilots and pilotage is exercised both by the States and the Federal Government. The regulation of pilotage by the States, however, is by permission of Congress. As the several States had detailed pilotage laws in 1789, Congress confirmed those laws by providing that "until further provision is made by Congress all pilots in bays, inlets, rivers, harbors, and ports shall continue to be regulated by the laws of the States wherein such pilots may be, or with such laws as the States may respectively enact for the purpose."

Congress has been obliged to supplement the State pilotage laws to prevent interstate friction. A vessel en-

tering a river or port forming the boundary between two States is required to take the first pilot offering his services; the pilots of one State may not be preferred over those of another. Congress has also prohibited a State from discriminating against interstate commerce by making the pilotage charges less for a vessel when its trip is between ports of the State than when it is sailing between ports in different States. The navigation laws of the United States require that the captain and mates of all steamers enrolled for the coastwise service shall qualify as pilots and be licensed by the United States. The States are prohibited from requiring the pilots of steam vessels to secure a State license in addition to the one granted by the United States. A coastwise steamer may enter a port without taking a pilot; but a sailing vessel cannot do so, even though the sailing vessel is towed into port by a steam tug on which there is a licensed pilot. This seems an unnecessary discrimination against the sailing vessel.

The control over pilots and pilotage exercised by the States may be illustrated by referring to Philadelphia and New York City. As Mr. J. B. Byall states: "One of the duties of the Board of Port Wardens (for Philadelphia) is to license pilots and to make rules for their government. There are eighty-four pilots, half of whom are licensed by the State of Pennsylvania and half by the State of Delaware. They serve in turn, first-class pilots taking vessels with draft of eighteen feet and over, and second-class pilots taking vessels of less than eighteen feet. The rate of pilotage is fixed by law, twelve feet draft and less being $1.87 per half foot; over twelve feet, $2.25 per half foot. Pilotage is compulsory. A vessel entering the Delaware River must lie beyond breakwater for twenty-four hours, if need be, waiting for a pilot, who, when accepted, must be paid according to the rate

decided upon by the State from which the pilot shall come."[1]

The laws of New York State limit the number of pilots at the port of New York to 130. They are an incorporated body. The members of the corporation take the ships in turn, the earnings are pooled and each member draws $200 a month when working full time. The State of New York does not require an incoming vessel to take a pilot unless one offers his services. The New York rates for pilotage are $4.88 per foot for vessels drawing 21 feet or more; for a draft from 6 feet to 14 feet the rate is $2.78 per foot; from 14 feet to 18 feet, $3.38 per foot; and from 18 feet to 21 feet, $4.13 per foot.

In the enforcement of health and quarantine regulations, also, both the State and Federal Governments participate. Each has the power of taking such measures as may be necessary to protect the health of its citizens. Congress has power to subject interstate and international travel and traffic to such rules and restrictions as the welfare of the country may require; and while each State is giving increasing attention to the prevention of diseases and epidemics within its borders, the tendency is to look more and more to the United States Public Health and Marine Hospital Service to regulate commerce to prevent the outbreak and spread of diseases. The National Government can adopt measures to be observed in all parts of the United States and in our insular possessions. It can also secure the coöperation of foreign governments in the work of checking disease.

As the protection of the health of its citizens is one of the police powers reserved by the States, the National

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[1] "The American System of Improving and Administering Commercial Facilities." *Annals of the American Academy*, November 1904, vol. xxiv, p. 494.

Government has been obliged, in the main, to work through the State authorities in its measures regarding public health. There is no question as to the power of the National Government to place quarantine restrictions upon interstate and foreign commerce; but as the States also have that power, the tendency, especially until 1893, was for the National Government to rely upon the States. In 1878 Congress provided for national quarantine; and in 1879, in consequence of the epidemic of yellow fever in the Southern States during 1878, a National Board of Health was created, to last for four years. This board of health not only operated through the United States Marine Hospital Service in aiding the State and local health officers, but also established numerous quarantine stations, and these temporary stations were, by an act of Congress passed in 1888, made permanent, and were equipped for their purposes.

The next step in the development of the national quarantine service was taken in 1893, in consequence of the danger to which the people of the United States were subjected by the appearance of the Asiatic cholera in the European ports from which large numbers of immigrants were brought to this country. This law provided "for the formulation of uniform regulations to be observed by all State and local quarantine authorities in preventing the introduction of epidemic diseases from foreign countries, and the spread of such diseases from one State or Territory to another." If the States or municipalities neglect or refuse to carry out the national regulations, the President can appoint officers to execute the rules. Since the passage of the Act of 1893, the Surgeon-General has supervised the State and local quarantine stations, and required them to conform to the standards fixed by the United States. Several of the State and local quarantines have been turned over to the Federal Government.

Until 1902 the title of Marine Hospital Service was retained without change, although the service had come to include all quarantine duties, the medical inspection of immigrants, and all measures taken by the United States to protect the public health; but in 1902 Congress gave the service the more appropriate title by which it is now known, the United States Public Health and Marine Hospital Service. The service remains under the Secretary of the Treasury, where it has always been.

A reference to the quarantine service at New York City will illustrate the activity of a typical State and of the United States at a port of first rank. The New York State Commissioners of Quarantine is a supervisory body, and under this board is a Health Officer's Department. For the port of New York there is a health officer, who is the active and responsible official for the enforcement of the State quarantine laws and the regulations of the State Commissioners of Quarantine at New York.

All vessels entering the port of New York must stop at the entrance to the bay opposite the quarantine station on Staten Island. One or more of the State health officers board the ship, and the bill of health from the port of departure must be shown by the master of the vessel, and he or the ship's physician must report all sickness, accidents, deaths, and births that have occurred on the voyage. If the vessel has come from an infected port, or if a contagious or infectious disease is found to exist among the passengers or crew, the ship may be fumigated and detained until the health officer thinks the vessel may discharge its passengers and cargo without endangering the public health.

The State quarantine charges at New York are as follows: Each vessel from a foreign port must pay an inspection fee of $5; and if the inspection is made after sundown, an additional fee of $5 is required. A charge

of $2 per hundred is made for the examination of steerage passengers; and if the vessel is disinfected, the charge is from $5 to $50. Ordinarily, coastwise vessels are exempt from inspection, but from the first of May to the first of November coastwise vessels from ports of the United States south of Cape Henlopen are inspected at the New York Quarantine Station, and a fee of from $1 to $3 is charged for the inspection.

After passing the State quarantine inspectors at Staten Island, the vessel may proceed to her pier; but if she has steerage passengers aboard, they must be landed at the United States Immigrant Station on Ellis Island, where each immigrant is given a medical inspection by the United States Public Health and Marine Hospital Service. The would-be immigrants that are found to have a disease that bars them from entering the United States must be taken back, by the company that brought them, to the port from which they came; and if it shall appear that the alien had the disease when he started on the voyage, and that the disease might have been detected by inspection, the steamship company is liable to a fine of $100.

By an act of Congress passed March 3, 1903, every immigrant entering this country who is not a citizen of the United States, Canada, Cuba, or Mexico, must pay a duty of $2 and the money thus collected shall constitute an "immigrant fund" to defray the expense of regulating the immigration of aliens into the United States.

In the regulation of piers, wharves, docks, elevators, and other facilities for handling traffic, the States have full authority. The Federal Government has complete control over the navigable channel, and fixes the lines beyond which shore structures may not extend into the channel; but between the pier line and the shore the State power is supreme. The different methods followed by

the States in the management or regulation of the transfer and storage terminal facilities were briefly considered in Chapter IV, where it was explained that two States—California and Washington—have retained the ownership of the water frontage, and have established State harbor commissions to construct and administer the docks and terminal facilities. Louisiana has given the city of New Orleans the ownership of the riparian rights at that port; but this property of the city is administered and improved by a board of commissioners appointed by the governor.

The more general tendency in the past in the United States has been for the State to provide for the regulation of the terminal facilities at the ports by the city government, and to allow individuals and corporations to purchase land along the water front, and to erect piers and wharves upon the property thus acquired. Such has been the policy of Pennsylvania, for example, in regard to the port of Philadelphia, where the river frontage, as was explained in Chapter IV, is, with the exception of that at the ends of streets, on private property. The ownership is private, but the use may be public, whenever the needs of the commerce of the port may require the port authorities to assign a vessel to a private pier.

In New York the theory of the colony and the State has been that the water frontage should be the property of the city, and at the present time over half of the docks and wharves are owned by the city. Unfortunately, the city has in the past disposed of a part of the frontage, and will be compelled to pay a large sum of money to repossess itself of the property previously turned over to private control.

Massachusetts has a State Board of Harbor and Land Commissioners, to which is intrusted the general care and supervision of the harbor and tidewater within the commonwealth. The powers of the board were enlarged in

1897, and since then the board has acquired the ownership of some of the harbor frontage in Boston, and has erected one large pier in South Boston.

The general tendency among the States is toward the establishment of State or municipal harbor boards with increased powers. The tendency is also in the direction of the limitation of private ownership, and toward the centralization of the powers of supervision or public ownership in a public board, whose members are in some instances State officials, and in other cases city officers whose powers are derived from the States.

The municipal government exercises police supervision over the port under its jurisdiction, and in the case of a great harbor and port like New York this is a task of some magnitude. In 1905 the waters of Greater New York were under the control of the forty-second police precinct, to which there were attached a steamer—the *Patrol*—four steam launches, three naphtha launches, and seven rowboats. The police force comprised one captain, six sergeants, twelve roundsmen, and sixty patrolmen. The force of men in charge of the steamer *Patrol* is subject at all times to calls to assist the police in boarding incoming vessels when necessary, in taking off prisoners, in attending and aiding at fires among shipping or along the river front, in keeping order on excursion steamers, and in assisting vessels in distress. The launches and rowboats, with their crews, are assigned to posts which they patrol during their hours of duty, to enforce the laws and ordinances of the city, to recover drowned bodies, and prevent stealing, as far as possible, from the barges, vessels, and docks within the harbor.

The taxation of property invested in shipping, and the determination or regulation of the charges that shall be paid for the use of docks and other transfer and storage facilities, are powers which the States possess. The

policy of the States regarding taxation and port charges is considered in the following chapter.

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"The United States Public Health and Marine Hospital Service." (This is a pamphlet of forty-six pages comprising "a historical sketch" and an account of "the service as it is to-day," reprinted from the *Journal of the American Medical Association,* Chicago, 1904.)

"Report of the State Board (of Massachusetts) on Docks and Terminal Facilities." Boston, 1897. (This volume gives an account of the control of docks and terminal facilities at the large ports of the United States and of Europe.)

# CHAPTER XVII

## PORT AND TERMINAL CHARGES AND THE TAXATION OF SHIPPING

A VESSEL entering or clearing a port has several charges to pay, whether the port is administered directly by public authority, as at Hamburg, Germany, by a "public trust," as at Liverpool, England, or jointly by a public board and private corporations subject to Government regulation, as in most ports of the United States. The charges consist in part of tonnage taxes and the custom-house, quarantine, port-warden, and consular fees imposed by the Government, and in part of the pilotage, tonnage, wharfage, and stevedore expenses of a strictly commercial character. In addition to these charges there are various other items of expense, varying with the character of the vessel, the nature of the cargo, the time the ship is in port, and the navigation laws of the different countries. All the charges necessarily incurred by a vessel in entering and clearing a port, and in discharging and loading its cargo, with the exception of the wages of stevedores, may be and usually are carefully regulated by public authority. In the United States this power of regulation is divided between the Federal and State governments.

Some tables giving the charges actually paid by vessels at representative ports of the United States will indicate clearly what terminal expenses must be met by the ocean carrier. The first table refers to a tramp

steamer of 1,200 tons net register, with a cargo of 800 tons of agricultural implements, and states the expenses of entering the port of New York and discharging its cargo. This table does not give the cost of clearing the port, and omits various expenses that are cited in the following tables:[1]

| | |
|---|---|
| Pilotage, draft of 18 feet, at $4.13 a foot | $74.34 |
| Federal tonnage tax, at 6 cents per ton net register | 72.00 |
| Custom-house charges | 5.50 |
| Health officer's fee | 5.00 |
| Quarantine inspection charges | 5.00 |
| Survey of hatch (port warden's charge) | 2.00 |
| Wharfage (open, unroofed pier), five days | 45.00 |
| Discharging cargo, 40 cents per ton | 320.00 |
| Tugs for towing and docking | 20.00 |
| Total | $548.84 |

This ship could have entered and discharged its cargo at Antwerp, Belgium, for $443.62, during the summer months, and for $484.48 during the winter, when the pilotage rates are higher. The charges at Rotterdam during the summer would have been $396.76; at Hamburg, $600.11; at Havre, $741.52; and at Liverpool, $1,075.43. The high costs at Liverpool are due to the expense of docking the ship, and to the higher charges for discharging the cargo.

The second table is more instructive, because it gives the cost of entering and clearing the port of New York, and includes all the various items of expense actually incurred in discharging a cargo of general merchandise and taking on another general cargo. It will be noticed that the ship was a sailing vessel, and had to be towed into and out of port. Its costs for loading and unloading were more than they would have been had the ship been

[1] See *United States Daily Consular Reports*, April 21, 1904.

a steamer. The heavy wharfage charges show that the ship was in port for some time. The long trip from China necessitated putting the ship in the dry dock.

ENTRANCE, CLEARANCE, AND PORT CHARGES AT THE PORT OF NEW YORK FOR A SAILING VESSEL OF 1,760 TONS NET REGISTER, WITH 3,570 TONS GENERAL CARGO FROM CHINA, AND 600 TONS SHINGLE BALLAST, AND OUTWARD WITH 3,421 TONS GENERAL CARGO TO AUSTRALIA [1]

| | |
|---|---|
| Custom-house entry, health officer, United States tonnage tax, and hospital dues | $127.54 |
| Note of protest | 1.00 |
| Port warden | 15.00 |
| Pilotage inward | 78.34 |
| Pilotage outward | 80.10 |
| Towing inward | 40.00 |
| Towing outward and in harbor | 110.00 |
| Wharfage | 445.70 |
| Stevedore, discharging | 481.95 |
| Stevedore, loading | 1,901.55 |
| Water | 20.00 |
| Rating chronometer | 3.00 |
| Ballast discharging, 350 tons | 70.00 |
| Carpenter | 217.01 |
| Coal, wood, and lumber | 105.83 |
| Clerk, delivering cargo | 76.50 |
| Watchman | 85.25 |
| Cooperage | 81.20 |
| Dry dock | 176.30 |
| Custom-house clearance | 2.70 |
| Total | $4,118.97 |

The wharfage charges allowed by the laws of the State of New York are 2 cents per day per register ton up to 200 tons, and $\frac{1}{2}$ cent per ton in excess of 200 tons. For vessels occupying an outside berth the rates are one

[1] This table is taken from Urquhart, "Dues and Charges on Shipping in Foreign Ports."

half. Steamers requiring an entire pier pay from \$25 to \$100 per day. The minimum port-warden charge is \$2; for each survey made the fee is \$2, plus \$1 for the certificate of the survey. For measuring and valuing a vessel the port-warden's fee is \$10. Although there are no compulsory hospital dues at American ports, "most foreign vessels pay dues to hospitals at rates arranged by their consuls."

The following tables show the port charges at Philadelphia for typical sailing vessels and steamers carrying typical bulk cargoes. The tables were compiled by Peter Wright and Sons, of Philadelphia, and the facts presented represent actual up-to-date business conditions:

PORT AND TERMINAL CHARGES INCURRED BY A SAILING VESSEL INWARD AT PHILADELPHIA IN BALLAST, AND OUTWARD TO JAPAN WITH 75,800 CASES OIL, 1,735 TONS NET REGISTER, 1,801 TONS GROSS REGISTER

| | |
|---|---|
| Tonnage tax, 1,735 tons, at 6 cents | \$104.10 |
| Entrance surveys | 5.50 |
| Health fees | 10.00 |
| Custom-house brokerage | 2.50 |
| Inward pilotage, 11½ feet, at \$4 per foot | 46.00 |
| Towage from sea to Philadelphia | 170.00 |
| Towboat for inward docking | 18.00 |
| Towage in harbor | 88.00 |
| Discharging 588 tons ballast, at 28 cents per ton | 164.64 |
| Wharfage, loading, 13 days, at \$9.25 | 120.25 |
| Lumber and wood | 325.00 |
| Stevedore, loading, 75,800 cases, at ⅞ cent | 663.25 |
| Custom-house clearance | 2.70 |
| Custom-house brokerage | 2.50 |
| Consul fees | 29.90 |
| Attendance fee | 51.14 |
| Towage to stream | 52.00 |
| Towage to sea | 176.00 |
| Pilotage outward, 21½ feet, at \$5.00 | 107.50 |
| Total | \$2,138.98 |

PORT AND TERMINAL CHARGES INCURRED BY A SAILING VESSEL INBOUND FOR PHILADELPHIA FROM JAVA, WITH 2,018 TONS SUGAR, 1,422 TONS NET REGISTER, 1,611 TONS GROSS REGISTER

| | |
|---|---|
| Tonnage tax, 1,422 tons, at 6 cents | $85.32 |
| Entrance surveys | 5.50 |
| Health fee | 10.00 |
| Noting protest | 1.50 |
| Custom-house brokerage | 2.50 |
| Inward pilotage, 19½ feet, at $5 | 97.50 |
| Towage from sea to dock | 192.00 |
| Boatman running lines | 3.00 |
| Survey on hatches and cargo | 13.00 |
| Copy surveyor's report | 1.75 |
| Custom-house permits, certificate of weight, etc | 1.00 |
| Wharfage, 14 days, at $9.47 per day | 132.58 |
| Cooperage, 2,018 tons, at 2 cents per ton | 40.36 |
| Stevedore, discharging, 2,018 tons, at 28 cents | 565.04 |
| Postage and petties | 5.00 |
| Advertising crew | 5.00 |
| Attendance fee | 51.14 |
| Total | $1,212.19 |

PORT AND TERMINAL CHARGES INCURRED BY A SAILING VESSEL OUTBOUND FROM PHILADELPHIA, LOADING 2,210 TONS COAL FOR CAPETOWN, SOUTH AFRICA, 1,422 TONS NET REGISTER, 1,611 TONS GROSS REGISTER

| | |
|---|---|
| Towage in harbor | $68.00 |
| Ballast logs | 75.00 |
| Trimming 2,210 tons, at 7 cents | 154.70 |
| Inspection of fittings and certificate of lading | 10.00 |
| Postage and petties | 5.00 |
| Custom-house clearance | 2.90 |
| Custom-house brokerage | 2.50 |
| Consul fees | 18.00 |
| Attendance fee | 51.14 |
| Towage to sea | 206.00 |
| Outward pilotage, 20 feet, at $5 | 100.00 |
| Total | $693.24 |

PORT AND TERMINAL CHARGES INCURRED BY A STEAMER OUTBOUND FROM PHILADELPHIA FOR JAPAN, WITH 166,594 CASES REFINED PETROLEUM, 2,768 TONS NET REGISTER, 4,232 TONS GROSS REGISTER

| | |
|---|---|
| Boatman running lines | \$6.00 |
| Towage in harbor | 90.00 |
| Electric lights | 47.90 |
| Wharfage, 15 days, at \$13.50 per day | 202.50 |
| Lumber and wood | 590.00 |
| Stevedore, loading, 166,594 cases, at $\frac{3}{4}$ cent | 1,249.46 |
| Winchmen, 296 hours, at 35 cents | 103.60 |
| Custom-house clearance | 2.70 |
| Custom-house brokerage | 2.50 |
| Consul fees | 20.00 |
| Attendance fee | 51.14 |
| Towage to ocean | 90.00 |
| Outward pilotage, 25½ feet, at \$5 | 127.50 |
| Total | \$2,583.30 |

PORT AND TERMINAL CHARGES INCURRED BY A STEAMER INBOUND AT PHILADELPHIA FROM JAVA, WITH 7,962 TONS SUGAR, AND OUTWARD IN BALLAST, 3,923 TONS NET REGISTER, 6,057 TONS GROSS REGISTER

| | |
|---|---|
| Tonnage tax, 3,923 tons, at 6 cents | \$235.38 |
| Entrance surveys | 5.50 |
| Health fees | 10.00 |
| Noting protest | 1.50 |
| Custom-house brokerage | 2.50 |
| Inward pilotage, 26 feet, at \$5 | 130.00 |
| Tug boats for inward docking | 30.00 |
| Boatman running lines | 6.00 |
| Survey on hatches and cargo | 13.00 |
| Copy surveyor's report | 1.75 |
| Custom-house permit, certificate of weights, etc | 1.00 |
| Wharfage, 10 days, at \$31.92 | 319.20 |
| Cooperage, 7,962 tons, at 2 cents | 159.24 |
| Stevedore, discharging, 7,962 tons, at 28 cents | 2,229.36 |
| Tally clerks, 11½ days, at \$3 | 34.50 |
| Custom-house clearance | 2.95 |
| Custom-house brokerage | 2.50 |
| Consul fees | 4.25 |
| Attendance fee | 51.14 |
| Towage to stream | 30.00 |
| Outward pilotage, 16½ feet, at \$5 | 82.50 |
| Total | \$3,352.27 |

The tables refer, among other items, to the United States tonnage taxes on ships. Vessels engaged in the coastwise commerce of the United States are exempt from tonnage taxes; but according to the Act of 1884, as amended in 1886 and now in force, a tonnage duty of 3 cents per ton net register, not to exceed 15 cents per ton in any one year, is imposed on each vessel entering "any port of the United States from any foreign port or place in North America, Central America, the West India Islands, the Bahama Islands, or the coast of South America bordering on the Caribbean Sea." Vessels entering from all other foreign ports pay 6 cents per ton at each entry, but not more than 30 cents per ton per annum. The law also provides that "the President of the United States shall suspend the collection of so much of the duty herein imposed, on vessels entered from any foreign port, as may be in excess of the tonnage and lighthouse dues, or other equivalent tax or taxes, imposed in said port on American vessels by the Government of the foreign country in which such port is situated."

In accordance with the provision just quoted from the law, the President has at different dates since 1884 issued proclamations exempting from tonnage taxes vessels from Colon and Panama; Monserrat Island in the West Indies; Greytown and Bocas del Toro in Nicaragua; Ontario, the Kingdom of the Netherlands and the Dutch East Indies, Guadeloupe, Grenada, and Copenhagen. For a time vessels from Germany were exempted from the tax, but the favor was withdrawn because of the charges imposed at German ports.

The tonnage taxes collected now amount annually to between $800,000 and $900,000. By the Act of 1884, this income is devoted to the maintenance of the Marine Hospital Service.

The reciprocity feature of the existing Federal tonnage tax law is evidence of the liberal international policy of the United States; but the American merchant marine has received but little benefit from the provision for reciprocal exemption of tonnage duties. Fortunately for our revenues, Great Britain, Germany, and the leading maritime countries, other than the Netherlands, have not abolished their tonnage taxes, light dues, and other charges, and qualified themselves for exemption from our tonnage charges.

The United States Commissioner of Navigation has for many years advocated the repeal of the reciprocity provisions of the Act of 1886. He says in his report for 1904: "If its purpose were to induce other nations to repeal corresponding taxes on shipping, it has failed, for, though in force nearly twenty years, its effects on foreign legislation have been inconsiderable. As a rule, the revenue requirements of foreign nations have not permitted the reduction or abolition of the taxes so readily collected and equitably distributed as are taxes on net tonnage at entry. If its purpose were to secure for American vessels special exemptions in foreign ports, it has been equally a failure, for the foreign ports at which no taxes corresponding to our tonnage taxes are levied, with some exceptions, are seldom visited by American vessels."

The Federal Government taxes the use or operation of ships engaged in international commerce by levying tonnage duties; the States, or such of them as choose to do so, may tax the ownership of vessels. Although the Supreme Court has been careful to deny to the States the power of levying any tonnage taxes and license fees on interstate and foreign commerce, the Court has at various times, from Gibbons *vs.* Ogden, in 1824, to the present time, upheld the State in taxing the property which its citizens may have in ships. The language of

the Court, in 1884, in Moran *vs.* New Orleans (112 U. S., 69), was that "vessels engaged in foreign and interstate commerce, and duly enrolled and licensed under the acts of Congress, may be taxed by State authority as property, provided the tax be not a tonnage duty, is levied only at the port of registry, and is valued as other property in the State, without unfavorable discrimination on account of its employment."

The practice of the States generally has been to tax property in shipping. During the period of our prosperity as a maritime country these taxes were not specially burdensome; but with the decline of our merchant marine in the foreign trade in competition with our more successful foreign rivals, the State taxes became an appreciable handicap upon the growth of our shipping. The desirability of relieving American shipping engaged in foreign commerce from State taxes was early recognized by New York, which in 1881 exempted vessels registered in the ports of that State and engaged in foreign commerce from all taxation for State and local purposes; and also exempted corporations, all of whose vessels were employed in foreign commerce, from taxes upon their capital stock, franchises, and earnings. The law as first enacted was to be valid for fifteen years, but in 1892 it was made effective for thirty years, i. e., until 1922. Pennsylvania and Alabama also impose no taxes on American ships engaged in the foreign trade, and Delaware lays no tax on any vessels. None of the other States has gone so far as these four have in freeing shipping from tax burdens, but several States impose lighter taxes on vessels engaged in foreign trade than are levied on coastwise shipping, and several States have lowered their shipping taxes during the past decade.

The laws of the States in regard to the taxation of shipping, as is true of legislation upon numerous other

subjects, are not uniform; and the taxes imposed by some States are in part evaded through the possibility of enrolling vessels outside of the State where they are mainly owned, and in the ports of a State where there are no taxes on shipping, or where the taxes are lower.

If the States are to continue to tax property in shipping, the taxes ought, for two reasons at least, to be made lighter than on other forms of property:

(1) A prosperous development of our merchant marine is especially to be desired. The American tonnage engaged in the foreign trade has such difficulty in competing with the vessels of other countries that there ought to be no handicap in the form of State taxes. The coastwise shipping is protected from foreign competition, but the progress of our maritime coastwise commerce has been only moderate. It would be for the best interests of the United States, industrially and commercially, to relieve our coastwise shipping of the burdens of State taxation.

(2) Another reason why a vessel should pay only a light State tax is that the ship spends but a small part of the time at its home port. Taxes are, at least in part, in the nature of fees which the State exacts from property in return for the services or benefits derived from the State. There are manifest reasons why property in a dwelling or an office block should pay a higher tax than should be levied upon property in a ship.

The abolition by the States of all taxes on shipping has much to commend it. "It is a mistake," says the Commissioner of Navigation in his report for 1895, "for the States in their relation to the Union to impose such taxes, for they place American vessels at a disadvantage in competition with the vessels of our sagacious and untiring foreign rivals. It is a mistake for the States in their relations to one another, for such taxes defeat their own ostensible ends by driving shipping from an exact-

ing home port to a port in another State more farsighted and liberal in its tax policy. These taxes are unfair, for, from the nature of the vessel, it can enjoy only to a slight extent the benefits of those public undertakings to which, in the main, the proceeds of State and local taxes are devoted."

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# CHAPTER XVIII

## THE MERCANTILE MARINE POLICY OF THE UNITED STATES

The maritime policy of our country has been broad, and in many respects liberal; but the results have been disappointing. The decline of our tonnage engaged in the international carrying trade during the past forty-five years has been so rapid and so continuous as to indicate that our policy toward shipping and navigation cannot have been altogether wise.

The American people feel keenly the chagrin of their defeat in the competition for the ocean-carrying trade; and however much consolation they may derive from the thought that the capital of the country has been profitably spent in building railroads and developing the vast natural resources of their broad territory, they nevertheless desire, if possible, to regain the maritime prestige they held during the first half of the nineteenth century. All sections and parties in the United States are agreed in wishing for success on the seas, but there is much difference of opinion as to the means by which success may be won.

The United States Government has fostered the shipbuilding industry in four ways:

(1) Congress has always restricted American registry to "vessels built within the United States," the only exception to this being (*a*) "vessels which may be captured in war by citizens of the United States, and lawfully condemned as a prize, or which may be adjudged to be for-

feited for a breach of the laws of the United States, being wholly owned by citizens"; and (*b*) foreign-built vessels wrecked in the United States, and purchased and repaired by American citizens, provided "the repairs put upon such vessel are equal to three fourths of the cost of the vessel when so repaired."

(2) Our coastwise and domestic commerce is open only to American vessels. This policy has been in force since 1817, when the law, still in force, was passed debarring foreign vessels from our domestic trade and fisheries. Indeed, from 1789 to 1817 foreign ships seldom engaged in our coastwise business, because the American ships could usually perform the service better and cheaper than could their foreign rivals. No other law has done so much for the American shipbuilding industry and for our merchant marine, during the past fifty years, as has this Act of 1817. In 1904, nearly six sevenths of the total tonnage of our merchant marine was engaged in the coasting trade and sea fisheries; and while the tonnage of our over-sea marine has declined, the tonnage of our domestic fleet has steadily risen. The growth in our domestic fleet has been most rapid on the Great Lakes, and slowest upon our other inland waterways. The progress of our maritime coastwise fleet has been moderately rapid; but if the coastwise commerce of the United States had been open to foreign ships during the past fifty years, they would probably be carrying most of our domestic maritime traffic at the present time.

(3) Congress gives shipbuilders the advantage of allowing them to import free of duty such foreign materials as they may desire to use in constructing or repairing vessels to be sold to foreigners, or to be sold to citizens of the United States to be "employed in the foreign trade, including the trade between the Atlantic and Pacific ports of the United States." The articles exempted

from duty include all such materials as may be used in building the machinery of the vessels or in fitting out and equipping the ships. The value of these exemptions from duty is, however, greatly lessened by the provision of the law stipulating that the vessels receiving these benefits "shall not be allowed to engage in the coastwise trade of the United States more than two months in any one year." Of course, no vessel owned by foreigners can engage in our coasting trade at any time; our commerce with Hawaii, Alaska, and Porto Rico is now a part of our coasting trade, and on July 1, 1906, our trade with the Philippines will be so considered, unless, as is probable, the closing of our trade with the Philippines to foreign ships shall be postponed until 1909, as has been recommended by the Secretary of War.

American shipbuilders have not built merchant ships for foreign sale during recent years, nor have they constructed many vessels to be employed by Americans in our foreign trade, consequently only small amounts of foreign materials have been imported for ship construction. Nor is it probable that much use will be made of the privilege of free imports in the future, because as the report of the Merchant Marine Commission of 1905 stated, "no American shipowner under present conditions builds a deep-sea ship, even though she be designed primarily for foreign commerce, without considering that he may be glad some day to fall back on the coastwise trade, now extended to Hawaii, Porto Rico, and soon to include the Philippines." This report further states that in the complete construction of only one large steel ship, the *Dirigo*, built by Arthur Sewall and Company at Bath, Maine, has the privilege of free foreign materials been accepted, and the results in this instance have not proven satisfactory, although the *Dirigo* is operated on the Pacific, between Puget Sound and Hawaii.

(4) The naval policy of the United States during the past twenty years has been of great assistance to the shipyards located on our seaboard. The orders from the Government for war vessels have enabled our shipbuilders to modernize their plants, and have encouraged them in starting new yards, such as those at Newport News, Camden, and Fore River. The relatively large naval tonnage constructed by the United States has been carefully distributed among the shipyards on our Atlantic and Pacific coasts; the Government work has required the steady employment of many thousand men, and has developed a large body of skilled mechanics and a corps of naval architects.

The American shipbuilder is unable to compete with foreign yards in the construction of ships for sale in the world's market for vessels, and the tonnage under our flag engaged in foreign trade has remained stationary for some years at the low level of 800,000 to 900,000 tons, consequently the market for American-built merchant ships fluctuates with the changes in industrial and commercial conditions of a single country, the United States. During the years 1900 to 1902 inclusive, American shipyards were busy; then followed a period of depression. In 1905 shipbuilding on the Great Lakes was active, and will be so during 1906; but in 1904 and 1905 the seaboard yards were obliged to restrict their work to only a half or a third of their capacity.

The fluctuating character of the American shipbuilding industry would have been fatal without the great assistance the shipyards have received from the steady and profitable business of constructing naval vessels. Indeed, the naval programme has kept some of our large shipyards from becoming bankrupt and going out of existence during the past ten years.

The policy of the United States toward ocean navi-

gation—toward the ownership and operation of vessels—may be briefly summarized as follows:

(*a*) Our tonnage taxes are light and the laws favor American ships in two ways: Vessels engaged in our coastwise and inland domestic commerce and in our fisheries are exempt from all tonnage taxes, and by this provision of our law six sevenths of our shipping is relieved from tonnage dues. Again, American ships are favored by the lower tonnage taxes of three cents per ton per entry and fifteen cents per ton per annum imposed on vessels plying between the ports of the United States and the ports of other North American countries, the West Indies, and the Caribbean coast of South America. Although this lower tonnage tax on the ships engaged in our near-by foreign trade applies to foreign as well as American vessels, the fact that American vessels are used more for that part of our foreign trade than they are for our trade with more remote countries makes the half rate of tonnage taxes for the near-by foreign trade an advantage to American shipping.

(*b*) The Federal Government improves, maintains, lights, and buoys the harbors and channels of our ports without any cost to shipping, and, with few exceptions, without expense to the cities and States within which the ports are located. The only charge imposed by the United States upon shipping that might be considered a tax levied to cover the costs of harbor and channel improvements are the tonnage taxes levied upon vessels entering our ports from foreign countries, and since 1884 the receipts from the tonnage dues have been devoted to the maintenance of the Marine Hospital Service. Our tonnage tax rates are low, and they yield only one third the amount of the corresponding taxes—"the light dues"—imposed by Great Britain. At Bremen, Hamburg, and other Continental ports, the tonnage taxes, or

light dues, are higher than the British charges, and thus much higher than the American. Congress maintains our lighthouse establishment at an annual expense of about $5,000,000, by appropriations from the general treasury; whereas the "light dues" collected by the United Kingdom amount to $250,000 a year more than she expends upon her lighthouse establishment. It should be noted, however, that our low tonnage taxes apply to all vessels, foreign and American, engaged in trade between the United States and foreign ports, and that the larger share of our foreign trade is carried in ships flying foreign flags. Although our tonnage taxes, as was explained above, are so arranged as to favor American shipping, the fact that foreign ships pay nearly eleven out of each twelve dollars of the tonnage dues we now collect, shows that they derive more benefit absolutely from our low tonnage charges than ships under the American flag do.

(*c*) The United States, like other countries, favors the shipping under its own flag in its payments for carrying the mails. The contract service is restricted to American vessels, and the payments for carrying the mails are larger than the United States Post-Office Department would be obliged to make to foreign shipowners for performing the services covered by the contracts. These contracts for carrying the mails impose upon the contractors various other obligations than that of carrying the mails, and the payments made by the United States are intended to promote our mercantile marine and our naval strength.

The laws of the United States for the protection of American seamen have been a credit to our country. It has been the theory of our Government that the conditions of living on board American ships ought to be superior to those on foreign vessels, just as the standard of living among American laborers is higher than among

foreign workingmen. The first act passed by Congress in the interest of our seamen was enacted in 1790. It embodied the best usages of that time, and subsequent legislation regarding seamen has developed and enlarged the provision of our first law.

The legislation of every maritime country concerning its seamen is detailed, and regulates the manner of employing and discharging the men, requires the shipmaster to give his crew adequate food, and to provide each man with sanitary quarters. The law gives the captain power to compel the members of the crew to live up to their contracts, and protects the men against being discharged in a foreign port. In the requirements concerning rations and air space, the laws of the United States are more exacting than are the laws of other countries. It costs more to feed and quarter the crews on American vessels than on foreign ships.

Wages are fixed by contract between the master and the seamen, but the wages on American vessels average higher than on other ships. Although half the men employed on American vessels are aliens, more than half are shipped in American ports, where wages average higher than they do in foreign countries. The officers of our vessels are American citizens, and their salaries are higher than those of officers of foreign ships.

The facts upon which these statements regarding wages rest have been presented in much detail in the annual reports of the United States Commissioner of Navigation. The Merchant Marine Commission, which made its investigation in 1904, heard representatives of the seamen at sessions held by the commission in our Atlantic, Gulf, and Pacific ports, and, "as a rule, this evidence is to the effect that general conditions of life in the American merchant marine—wages, food, quarters, etc.—are superior to those in foreign countries."

The causes of the higher wages on our ships are somewhat complex. In so far as the officers and seamen are Americans, the wages are influenced by the economic and social forces that account for the high standard of living, and the corresponding high wages that prevail in the United States. A large part of the engine crews, and of other ship hands, particularly on the Pacific, are foreigners shipped in foreign ports, and it is probable that the masters of American vessels are not obliged to pay such foreigners higher wages than are paid by masters of other vessels; although it is probable that when aliens are employed a second time—i. e., are hired in an American port—the wages demanded by them may be influenced by the wages current in the United States.

The higher wages and better conditions of life on American vessels are by no means to be deplored; they ought, whatever the needs of the American merchant marine may be, to be carefully maintained. Indeed, it seems necessary that we should make seafaring a more attractive calling, if we are to build up our merchant fleet, and train the men required to man our growing navy. Since 1860, our marine engaged in foreign commerce has been declining; at the same time our industries on the land have been making rapid progress. American men and boys have more and more turned away from our declining over-sea marine, and have chosen callings at home, where greater prospects were offered. In adopting measures for building up our merchant marine, we shall unquestionably find great difficulty in solving this question of securing a *personnel* of Americans for our vessels.

The foregoing outline of the policy which the United States has pursued toward the shipbuilding industry, the ownership and operation of vessels, and toward the men aboard the ships under our flag, is sufficient to demon-

strate the fact that our country has dealt liberally with our maritime interests. Nevertheless, the results of our policy, as far as our shipbuilding industry and our marine engaged in foreign trade are concerned, have been a failure. Our foreign competitors have taken away from us not only the share we formerly had of the general ocean-carrying trade of the world, but have also secured nine tenths of the business of carrying our own foreign commerce. The causes that account for our decline in the ocean-carrying trade, and the measures that have been proposed to aid in building up our shipbuilding and shipping interests, will be considered in the following chapters.

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# CHAPTER XIX

## CONDITION OF THE AMERICAN SHIPBUILDING INDUSTRY. CONSIDERATION OF CAUSES AND REMEDIES

The shipbuilding industry in the United States has developed in accordance with the progress of our mercantile and naval marines. Until the Civil War our merchant marine was large, and increased year by year, and the American shipbuilders carried on an expanding business. They not only supplied the shipping purchased by Americans, but also sold a large tonnage to foreign buyers; because our shipwrights could build wooden vessels cheaper and better than their competitors could. The American packets and clipper ships enjoyed an enviable reputation for seaworthiness and speed. The decline in the demand for American-built ships among home and foreign buyers fell off with the gradual substitution of iron for wood in vessel construction after 1850, and with the decrease, which began in 1861, in the tonnage of American vessels engaged in the international carrying trade.

Shipbuilding activity in the United States reached its maximum during the decade ending with 1861. During those ten years there were 3,600,748 tons of shipping constructed in American yards. The output was greatest in 1854 and 1855, when 1,119,496 tons—about 560,000 tons annually—were launched. Those are the only years in our history when the annual tonnage of shipping constructed has exceeded 500,000. During this decade pre-

ceding the Civil War the total tonnage of the American merchant marine rose from 3,500,000 tons to 5,500,000, and during those years there were 350,000 tons of shipping sold to foreign buyers.

The Civil War required the construction of a great many war vessels, and it would not have seriously crippled our shipbuilding industry had the war been followed by a demand for American-built ships. The demand did not follow the war, because foreign buyers desired to purchase iron ships, which our yards could not supply, and because ships operated under the American flag were not able to compete successfully with foreign vessels in the international carrying trade. Moreover, for twenty years following the Civil War the United States Government neglected its navy and placed no orders for war vessels among our shipbuilders.

The effect of these causes upon the decline of our shipbuilding activity for over thirty years after the Civil War is revealed in the statistics of tonnage annually constructed. At the end of the war our shipyards were turning out annually between 300,000 and 400,000 tons of ships of all classes; but with the exception of two periods of temporary revival—one in 1873 and 1874, and the other in 1891—the annual output did not reach 300,000 tons until 1899. Moreover, these figures do not indicate the real decline in our shipbuilding industry, because they include the tonnage constructed for our increasing coastwise trade, and for our Great Lakes and other inland waterways where only American-built ships may be employed. The merchant tonnage annually built on our seaboard amounted to about 300,000 tons at the close of the Civil War, after which it declined to about 100,000 by 1880. A short revival came in the early eighties, and another in the early nineties; but with those exceptions the coastwise shipyards made no headway after

1880 until the prosperous period beginning with 1899 was reached, then six years followed during which there was an average output of 250,000 tons. The vessels constructed by our seaboard yards are partly for the foreign trade, but more largely for our expanding coasting trade. Our yards are not turning out ships for sale to foreigners, and not many ships to be bought by Americans for registry under our flag.

Why is it that the shipyards on the New England seaboard and along the Delaware and Chesapeake cannot construct ships in competition with the builders on the Clyde, Tyne, and Severn? Why is it that the only buyers of American-built vessels are those who purchase ships to be operated under our flag, and are compelled by our navigation laws to secure their vessels from American yards? "What is a steamship, but a locomotive and a steel bridge wrought together?" We export locomotives to many countries, and build bridges in various remote parts of the world, but we cannot compete with the foreign builders in the construction of steel vessels. We can do as good work as any builders can, but the foreign shipyards can do the work for less cost.

That ships can be built more cheaply under present conditions in British and German yards than in American yards is a well-established fact. The Merchant Marine Commission stated, in its report made in January, 1905, that "recent actual bids of American, British, and German yards for typical North Atlantic steamships, which have been communicated to the commission, show an American excess of cost of about forty-seven and thirty-seven per cent." Mr. P. A. S. Franklin, vice president of the International Mercantile Marine Company—a company owning ships under several flags—testified before this commission that "an American-built steamship, suitable for the North Atlantic trade, would cost about

forty per cent more than a British-built steamship." Mr. F. W. Wood, president of the Maryland Steel Company, testified that "the average difference in cost between American and British ships under present conditions is from thirty to fifty per cent."

The price of steamships in British yards in 1904 and 1905 was below the normal average, because of the small demand for ships during those years; but even in prosperous times the British and German yards are apparently able to construct merchant vessels for much less than the American builder must charge. The above estimates indicate that ordinary freight and passenger vessels would have cost about forty per cent more in 1904 if built in an American yard than if constructed in Great Britain or Germany. Previous estimates have placed the cost of the American-built ship from fifteen to twenty-five per cent above the cost of the foreign-built vessel. While the exact difference between American and foreign costs cannot be stated, all witnesses are agreed that the American costs are higher. Under present conditions the foreign builder probably has the advantage of the American constructor by fully twenty or twenty-five per cent. The difference in cost, whatever it may be, is quite enough to enable the foreigner to underbid successfully our shipbuilders, and the result is that an American company desiring to increase its fleet usually orders the ships built abroad, and then operates the vessels under some foreign flag. While this chapter is being written, the announcement is made that the United Fruit Company—an American corporation controlling most of the fruit trade into the United States from the West Indies and Central America—has just placed an order for some steamers with a British builder.

The chief causes accounting for the higher cost of building ships in this country than in Great Britain or

Germany are (1) the higher prices of materials in the United States, (2) the higher labor costs in our shipyards, and (3) the small amount of tonnage constructed in our yards. The first of these causes is no longer a factor of great importance, but the second and third causes operate very powerfully against the American shipbuilders.

(1) The price of steel is ordinarily as low in the United States as in any country; and some forms of steel and some manufactured articles made of steel can be produced cheaper here than abroad; nevertheless, the shipbuilders on the Clyde and Tyne can usually secure their steel plates, boilers, and engines more cheaply than they can be obtained under present conditions in an American shipyard, because the British builders construct several ships at once of the same design. Materials and equipment for several vessels can be secured more economically than they can be obtained for one or two ships, just as a real-estate operator can buy the materials for several houses to be constructed simultaneously at a lower cost per house than he could buy the materials for a single house. Likewise, a British builder has the advantage of the buyer who can duplicate his orders frequently. The steady buyer who purchases large quantities is the one who secures the lowest bids.

American shipbuilders have also testified that the fluctuations in the price of steel in the United States are much greater than in Great Britain, and that this fluctuation is a handicap in bidding for contracts. Two main reasons have been assigned for the larger variations of steel prices in this country than in the United Kingdom. One cause is that of the duty which we place upon imported steel. This duty excludes foreign-made steel and steel products from the United States, and causes the prices of steel in this country to vary with the changing conditions of our domestic production and consumption,

and deprives us of the steadying influences upon prices that result from enabling the buyer to draw upon a world market.

Our tariff on steel, moreover, has sometimes resulted in American steel being sold to foreign shipbuilders cheaper than to American. The president of the American Shipbuilding Company testified before the Merchant Marine Commission, at Cleveland, June 28, 1904, that "recently one of our largest steel mills sold abroad 100,000 tons of steel plate. They delivered it, I understand, at Belfast, at $24 a ton. That would practically mean, with ocean rates as they now are, $22 a ton at tide water (in the United States). They are charging us to-day, at Pittsburg, $32 a ton." From the point of view of the manufacturer of steel, there may be good business reasons for disposing of his surplus product at a reduced price to the foreign buyer, instead of depressing the price at home by selling the surplus upon the domestic market; but the depressing effect of this policy upon the American shipbuilding industry is unquestionable.

The variations in the price of steel required in shipbuilding in Great Britain are lessened to some extent by the coöperation of the steel-manufacturing and shipbuilding industries. The celebrated British firm of Vicker's Sons and Maxim is an instance of the combination of steel manufacturing, armor-plate making, and shipbuilding under a single management. As Dr. John Franklin Crowell, formerly Commerce Expert for the United States Bureau of Statistics, said in 1900 in a report on the shipping industry of the United States, "steel production is the fundamental industry with regard to shipbuilding, and the chief obstacle in the evolution of the latter industry in the United States to-day is the fluctuation of prices and the lack of stability in the steel market. Just as bridge building has had to expand into steel manufacture,

so will steel shipbuilding have to absorb steel producing for its own protection from impossible prices, which interfere so seriously with the even tenor of industry."

The accuracy of this analysis is evidenced by the efforts the American shipbuilding industry has made to bring steel making and ship construction under a common control. Unfortunately, the most important attempt as yet made to accomplish this was defeated by the highly speculative methods adopted in the formation of the United States Shipbuilding Company, which was to have brought together the Bethlehem Steel Company and numerous shipbuilding companies.

Without doubt American capitalists will ere long be able to bring about the combination of the shipbuilding and steel-making industries in such a way as to give the American shipyard the advantage of stable costs for materials. Moreover, it is probable that if American shipbuilders can succeed in reducing the high labor costs that, more than any other cause, make vessels constructed in our shipyards more expensive than those constructed abroad, they will be able not only to establish stable prices for their necessary materials, but will also be able, in time, to enlarge and specialize their business so as to secure steel, boilers, engines, etc., as cheaply as they can be obtained by any British or German builder.

(2) The handicap of higher labor costs is an obstacle which the American shipbuilder will find difficult to overcome. Although it is not probable that the labor costs per ton of shipping constructed in American yards will always be higher than in foreign yards, there is no immediate prospect of our builders being able to reduce those costs to the foreign level. Labor costs are a function of two variables, wages and the units of work performed; consequently it is hardly possible to compare accurately the labor costs in American and foreign shipyards.

Wages can be compared without great difficulty; but the labor costs at home and abroad per unit of product in the various operations connected with building a ship cannot readily be contrasted; indeed, the data required for such a comparison probably do not exist.

The scale of wages paid in American shipyards is unquestionably higher than in foreign. The Merchant Marine Commission stated in its report that "evidence before the commission, notably in the important hearing of November 19, 1904, at Newport News, shows that wages in American shipyards are from fifty to one hundred per cent above wages of similar labor in Europe." The commission, however, is of the opinion that "both the labor and the administration in American shipyards are more efficient than in foreign shipyards, though this superiority is far from bridging the entire difference in cost."

The lower labor costs in British shipyards, as compared with American, result not only from the lower wages paid, but also from two other causes: the standardizing of processes, and the large amount of labor done on the piece-work system. The builder who constructs several cargo steamers at the same time, and can repeat his operations, as a whole or in large part, several years in succession, can secure both materials and labor at an economical figure. His workmen repeat their tasks and increase their efficiency, the builder standardizes his processes, and the piece-work plan of payment becomes possible. The great success achieved by Americans in the economical manufacture of stationary and locomotive engines, machinery, and tools has been the result mainly of standardizing the parts and the processes. The success of foreign shipbuilders is to a large extent due to the same cause.

(3) The German, and especially the British, ship-

builders have the benefit of doing business on a large scale. British yards annually launch between 1,500,000 and 2,000,000 tons of shipping, and over half of the output is sold to foreign buyers. In 1904 American yards turned out 378,000 tons; the output during the banner year of 1901 was 483,000 tons, and the only buyers were Americans. The British yards thus construct about four tons of shipping to one built in America; and the British builders have the advantage of a world market where the fluctuations in demand, although large, are much less than are characteristic of a market restricted to but one country, and that a country whose shipping engaged in international trade comprises but one seventh of its total marine.

The British builders have the advantages resulting from large-scale production, from specialization in work, and from repetition of orders. The typical yard on the Clyde is one having several ships of the same or similar design in simultaneous construction. The usual conditions prevailing in an American shipyard were well described by Mr. Lewis Nixon in 1900, who said: "In one of the largest shipyards in this country there are five slips, each capable of building a *Campania,* and recently on one was a tug, on another a battleship, on another a ferryboat, on another a yacht, and on another a revenue cutter." And Mr. Nixon adds: "It is absolutely impossible to practice economies under such circumstances, and build the ships so that they would compare favorably in cost with ships built abroad."

While it is probable that the shipbuilding industry in the United States may ultimately be able to overcome the disadvantages by which it is now hampered, and may in time be able to produce ships for our international trade, and for the world's ship market, in successful competition with foreign shipyards, it is certain that our shipbuilders

will not be able to do this in the near future. The American people for patriotic and economic reasons and our Government for military and naval reasons, can but deplore the unpromising status of our shipbuilding industry. Although the disposition of the people of the United States has been to deal liberally with our shipbuilding, as well as with every other manufacturing industry, and although our shipbuilders have been aided by our laws restricting American registry to ships built in our own country, by the law denying foreign vessels the privilege of engaging in our coastwise commerce, by the law allowing a drawback on the duties payable on materials imported for shipbuilding, and by the extensive naval programme of our Government during recent years, nevertheless the policy of the United States toward shipbuilding has not resulted in building up that industry.

Is it advisable that the United States should change its policy toward the shipbuilding industry? The answer to this question must depend upon the prospect of our being able, through Government aid and at a warrantable cost, to establish such conditions as will enable our shipbuilders to compete with foreign builders, and enable our shipping interests so to increase the tonnage of shipping under our flag as to restore to American ships a large share of the transportation of our foreign commerce.

The fact must be kept in mind that a large development of our shipbuilding industry will not be possible without the growth and prosperity of our over-sea merchant marine. Shipbuilding and ocean navigation are inseparable industries; and a complete answer to the question as to the advisability of changing our policy toward shipbuilding cannot be made until the aids to ocean navigation, to be discussed in the next chapter, have been considered.

Among the proposals that have been suggested for

giving increased Government aid to the American shipbuilding industry is one made by the Merchant Marine Commission of 1904, which recommended that the law permitting materials used in shipbuilding to be imported duty free, be so extended as to allow ships so built to be operated for six months each year in the coasting trade, instead of only two months as at present. The present law allows vessels employed in the trade between our Atlantic and Pacific seaboards to be built of materials imported free of duty, and the Merchant Marine Commission recommends that the same privilege be granted to vessels constructed for our trade with the Philippines. But few vessels have been built of imported materials, and the privilege of engaging for two months in the coastwise trade has not induced shipowners operating vessels in the international trade to buy ships in the United States and run them under American registry.

The law permitting the use of imported materials in shipbuilding was intended to increase the tonnage of shipping constructed in the United States, and as the privileges granted by the law have proven inadequate, they should be extended. The surest way to make the law effective in aiding our shipyards would be to permit our shipbuilders to import duty free all materials or machinery they may desire to use in constructing any ship, whether it is to be registered for the foreign trade or enrolled for the domestic service. Indeed, it would seem just to give our struggling shipyards the advantage of buying their materials and equipment wherever they can be secured most economically. Moreover, this modification of tariff laws seems desirable from the point of view of the public interest. The American people, for economic and patriotic reasons, are united in desiring to strengthen our maritime interests, and, whatever their views may be individually regarding protection or free

trade, they must wish our Government to remove as many as possible of the obstacles in the way of the development of the manufacture of ships in the United States.

Those engaged in steel manufacture, and in making the machinery required in equipping vessels, naturally desire the maintenance of a tariff on all imports of steel and steel manufactures; but the position of the steel industries in the United States is so secure that the exemption of ship materials from the present import duties could hardly retard the progress of steel making and steel manufactures in this country. In most instances our manufacturers would be able to meet successfully the competition of foreign producers; and if there should develop a large shipbuilding industry in the United States, the steel industries could hardly fail to benefit thereby.

In several countries—France, Italy, Austria-Hungary, Norway, and Japan—the government grants construction bounties to encourage shipbuilding. The bounties given by France to her shipbuilders have been especially liberal for twenty-five years. The first law providing for construction bounties was passed in 1881. This law was modified by the Act of 1893, which is still in force. The provisions of this later act were as follows: For iron or steel steamers and sailing vessels, a construction bounty of 65 francs ($12.54) per ton was granted; for wooden vessels of 150 tons or more, 40 francs ($7.72); for wooden vessels of less than 150 tons, 30 francs ($5.79). In addition to these construction bounties the builders also received 15 francs for each metric ton in weight of engines, boilers, and auxiliary machinery installed. This latter aid also includes new parts of machinery installed in repair of a ship. When new boilers are placed in vessels, the owners are entitled to receive 15 francs for each ton of weight of the new boilers. These bounties, al-

though liberal, have failed to overcome the adverse conditions under which shipbuilding must be carried on in France, as compared with Germany and the United Kingdom. The failure of the French policy of construction bounties does not prove that a similar policy would fail in the United States, where the conditions are more favorable for building steel vessels, but the experience of France is not encouraging.

There are well-recognized economic objections to aiding any form of manufacturing industry by means of Government bounties. Industries thus aided develop in response to an artificial stimulus in so far as the bounties are successful, instead of advancing step by step with the increase in the economic demand. Moreover, industries built up by bounties tend to become dependent upon the bounty, instead of independent of Government aid. The industry based on economic demand has a stable foundation; whereas the industry whose growth has been quickened by State bounties rests upon an insecure basis.

The surest way to strengthen the American shipbuilding industry is to create a larger demand for American ships—to increase the use of our ships in the international carrying trade. This means that the Government can best aid shipping by assisting in enlarging the tonnage of our merchant marine engaged in the foreign commerce of our own and other countries.

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Consult references at the close of the preceding chapter.

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# CHAPTER XX

## CAUSES OF THE DECLINE OF THE AMERICAN MARINE IN THE FOREIGN TRADE

THE decline in the tonnage of shipping engaged under the American flag in the foreign trade of the United States and other countries is so well known that it will be necessary, in this connection, to present only a brief review of the facts and figures regarding the past and present status of our deep-sea merchant marine. The tonnage of American vessels engaged in the foreign trade —our registered tonnage as contrasted with the "enrolled" shipping engaged in the domestic trade—reached its maximum in 1861, when the total of 2,496,894 tons net register was reached. At the close of the Civil War the total was nearly 1,000,000 tons less than at the opening of that great struggle. Until 1880 the figures averaged about 1,500,000 tons; but in 1880 a decline began that continued with but occasional interruption until 1898, when the minimum of only 726,213 tons was reached. The Spanish-American War of that year, and the demands of our increased commerce, brought the figures above 800,000 the next year, and the subsequent increase raised the total of 1905 to 954,513.

While our registered tonnage has been falling off, our enrolled shipping has been increasing. During the past twenty-five years the domestic fleet has risen nearly 3,000,000 tons—the increase during the last five years having been especially rapid. In 1899 the total of enrolled

tonnage was somewhat under 4,000,000 tons, and in 1905 the figures were 5,502,030. The total tonnage of the United States merchant marine in 1905—that engaged in the foreign and coastwise trades and in the fisheries—was 6,456,543. This is the highest point the tonnage of our shipping has ever reached, and the gain during the past twenty-five years has been 58.7 per cent, but the increase has all been in our coastwise and lake fleets. In that part of our commerce that is open to ships under foreign flags, American vessels have not been able to hold their own in competition with their foreign rivals; what progress our shipping has made has been in the carrying trade of which it has had an exclusive monopoly.

The decline in the tonnage of the American marine engaged in international trade is easily explained, and is fully accounted for by the following seven causes:

(1) The gradual but steady substitution of steamers for sailing vessels, and of iron for wooden hulls after 1850, transferred to the United Kingdom the superiority of advantage which the United States had possessed up to that time in the construction and operation of ships. The iron industries of Great Britain in 1850 were twenty five or thirty years in advance of those in the United States, and American manufacturers were unable to compete with the British either in the production of iron for hulls or of machinery for motive power. Moreover, until about 1890, steaming coal was far cheaper in Great Britain than in this country. The construction of iron ships in the United States did not begin much before 1870, and then in but a small way.[1] Vessel owners op-

[1] "The early statistics of iron shipbuilding in the United States have never been fully compiled. The tables of the Bureau of Navigation in the Treasury Department begin in 1869, with an iron tonnage built of 4,584 tons out of a total tonnage built of 275,230 tons, or 1.6 per cent. We know that iron vessels were built before this date in this country—

erating ships under the American flag did not desire to purchase iron steamers; at least, their demand was not sufficient to cause American shipyards to be reconstructed and organized for building iron vessels. Great Britain was prepared to change from wood to iron, and from sail to steam, and the United States was not; the result was that Great Britain secured a long lead over us in building and operating ships.

(2) While this revolution was taking place in the business of shipbuilding and navigation, two unfortunate causes tended to weaken the power of our maritime interests to compete with those in Great Britain. One cause was the withdrawal in 1858 of the support which the Federal Government had given our shipping under the laws of 1845 and subsequent years. A subsidy law was passed in 1845 providing for ocean mail contracts, and this law was supplemented by another act passed two years later.

According to Dr. Meeker,[1] the amounts paid in mail subventions from 1847 to 1858 were as follows: "Bremen Line (1847–57), $2,000,000; Havre Line (1852–57), $750,000; Collins Line (1850–58), $4,500,000; New York to Aspinwall (1848–58), $2,900,000; Astoria and San Francisco to Panama (1848–58), $3,750,000; Charleston to Havana (1848–58), $500,000. Total, about $14,500,000."

From 1858 until the close of the Civil War the companies carrying the foreign mails of the United States received the ocean postage only. With the restoration of

several in fact, before the war—but they were isolated cases, and probably in no previous year was the proportion as great as at the time when the records begin. In 1870 this proportion was three per cent, as against eighty-two per cent, in England." (J. R. Soley, p. 603 of "The United States," edited by N. S. Shaler.)

[1] "History of Shipping Subsidies."

peace, however, the advocates of a larger merchant marine secured the passage of laws providing for three mail contracts: one for a service from New York to Rio Janeiro, another from San Francisco to China and Japan, and a third from San Francisco to Hawaii.

The contract for the mail service between New York and Brazil expired in 1876; the Hawaiian service ended in 1873; and the contract for the Oriental service terminated in 1877. At that time the opposition to subsidies was so strong that no legislation providing for special mail contracts was enacted by Congress until 1891, when the law now in force was enacted. The provisions of that law have already been summarized. The report of the Postmaster-General, issued in December, 1905, states that there was expended during the fiscal year ending June 30, 1905, $1,431,621, to maintain the seven contract services now being performed under the law of 1891.

The action of Congress in 1858, repealing the mail subsidies granted to the transatlantic lines under the Act of 1845, was in part due to the bitter conflict between the North and South. Although the laws of 1845 and 1847 had been passed by a Democratic Congress, the Southern members of Congress, aided by some representatives from the agricultural States of the West, voted to repeal those laws. The Congressmen from the South felt that the mail subsidies were for the benefit of Northern shipowners rather than for the good of the country as a whole.

Whether the maintenance of a liberal mail subsidy policy would have kept our flag on the North Atlantic steam service, is uncertain; but it was at least unfortunate that we abandoned the Government support of our steam marine at a time when it so greatly needed aid in competing with foreign lines.

(3) The effect of the Civil War upon our merchant

marine was disastrous, because the shock of the war came at a critical epoch in the evolution of our shipping interests; at a time when our shipbuilders and shipowners needed support and assistance in tiding over the period of transition from sail to steam and wood to iron. Instead of receiving aid to enable it to meet foreign competition, our shipping was for four years heavily taxed, and was either idle for want of traffic to carry, or, subject to capture by Confederate cruisers, the most destructive of which were fitted out in the shipyards of Great Britain, our most serious maritime rival. The registered tonnage under the American flag in 1861 was 2,642,628; five years later it was only 1,492,926. About 800,000 tons of American vessels were sold to our foreign rivals or transferred to a foreign flag during the war; Confederate cruisers captured about 100,000 tons; over 150,000 tons were lost at sea; nearly 100,000 tons were bought by the United States and converted into war vessels; and the average number of vessels was annually abandoned and taken from the register because worn out.

(4) It would seem that our Government would have been quick to give assistance to our merchant marine at the close of the war. No industry had suffered more during that conflict; none had greater need for, nor a greater claim upon, Government support. Congress supported our manufactures by maintaining a high protective tariff, but failed to take effective measures to build up our merchant marine. The only assistance given to our shipping by the United States Government was the legislation providing for the mail services between New York and Brazil, and between California and Hawaii, Japan, and China. These subsidies covered only a few routes, and those of minor commercial importance. Moreover, the assistance was withdrawn at the end of ten years.

Indeed, Congress burdened American shipping in four

ways, none of which was necessary or justifiable: (*a*) By the law of February 10, 1866, Congress refused to permit vessels that had been transferred from our flag to a foreign standard during the war to be readmitted to American registry. This law did not benefit the shipbuilding industry, and was against the public interest, because it checked the increase in the tonnage of our merchant marine. (*b*) Another mistake was made by Congress in waiting until 1868 before repealing the heavy revenue taxes that had been placed upon shipping during the war period. (*c*) Shipbuilders were not given the privilege, until 1872, of importing duty free the materials to be used in constructing and equipping wooden vessels for the foreign trade; and it was not until 1890 that Congress exempted from duty materials to be used in constructing iron and steel vessels for use in international commerce. It is not probable that our shipbuilding and maritime industries would have gained much by an earlier exemption from duties on materials employed in constructing ships for our foreign trade, but whatever effects the duties had were against our shipping interests. (*d*) Liberal payments for carrying our ocean mails under favorable time contracts were not provided for until 1891. A law similar to the Act of March 3, 1891, or one broader in scope, might well have been enacted immediately after the Civil War.

(5) The neglect of the American navy for twenty years after the Civil War deprived our shipbuilding and maritime interests of one of the most effective aids our Government might have rendered. By the close of the Civil War wooden vessels had become antiquated for naval purposes, but the United States took no steps to modernize its navy by constructing iron steamers. By delaying the construction of war ships, the United States avoided the use of iron, which had been superseded by

steel when we began to build up our present navy, and this has had its advantages; but the postponement of our naval programme from 1865 to 1885, and later, delayed the reorganization of our shipyards and the substitution of plants for building iron and steel steamers, in the place of yards for constructing wooden sailing vessels.

(6) From the account given below of the policy of France, Germany, the United Kingdom, and Japan, toward their merchant marines, it will be seen that those countries gave their shipping interests much more Government support than the United States gave the American merchant marine. Without considering whether the policy of our foreign rivals has been wise, or whether the United States should have given stronger support to our merchant marine, there can be no question that the aid given to foreign shipping made competition on the part of our marine more difficult. In addition to other handicaps under which our maritime interests labored—the more advanced condition of the iron and steel industries in Europe, the lead obtained by the United Kingdom in the international carrying trade, etc.—was added the greater Government support given to foreign shipping.

(7) The most fundamental reasons for the decline of the tonnage of our marine engaged in the foreign trade were not the political ones just referred to; the chief explanation is to be found in economic causes. During the latter half of the nineteenth century the energy of the American people and their available capital found highly profitable employment in settling the West, in developing our agricultural and forest resources, in opening our mines, and in providing our wide territory with transportation facilities. These problems of internal development took the young men of the Eastern States toward the West and away from the sea; while our rapidly grow-

ing manufacturing industries in the East gave both native Americans and the immigrants from abroad increasing opportunity to secure remunerative employment.

In a young and rapidly growing country, such as the United States was during that half century, capital as well as labor was scarce, and the domestic industries and trade readily absorbed all the capital the people of the United States could command. Moreover, as Dr. Crowell has stated, "capital devoted to shipbuilding for the sea trade had to earn returns under the stress of competition in the open world's markets, while the products of capital and labor within the national limits were sold in the national market, within which the prevailing rate of returns has always been higher than in the international markets."

There are evidences that economic conditions in American industry are becoming more favorable for the investment of American capital in the international carrying trade. Capital has increased rapidly during the past decade; our manufacturing and mining industries and our transportation system have reached a high state of development, and the people of the United States are beginning to have funds available for investment in the foreign countries or in ocean shipping. Indeed, a large amount of American money has already been invested in merchant shipping under the flags of other countries. To secure the investment of American capital in our over-sea marine has become a question of making the profits of operating vessels under our registry and flag as large as those obtainable from shipping under a foreign flag. This is partly an economic problem, but is, to some extent at least, a question to be solved by legislation. Before considering what measures ought to be taken by the United States to increase the over-sea merchant marine under our flag, it will be well to review briefly the

maritime policy prevailing in some of the leading maritime nations of the world.

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## CHAPTER XXI

### GOVERNMENT AID TO SHIPPING AND NAVIGATION IN FRANCE, THE UNITED KINGDOM, GERMANY, AND JAPAN

France has a comprehensive and liberal system of Government aid to shipbuilding and ocean navigation. In addition to the construction bounties briefly described in a previous chapter, France aids the shipping under her flag with general navigation subventions, and with generous payments for carrying her ocean mails.

France, like Great Britain and many other countries, has always thought it wise to give Government support to her citizens engaged in deep-sea fisheries. The act now in force for the aid of French deep-sea fisheries was enacted in 1890, and provides for an annual bounty of 15, 30, or 40 francs per man employed on a fishing vessel, the rate of bounty depending upon the kind and location of the fisheries being aided. There is also a bounty given on the importation and exportation of fish. In 1900 the retainers given to the fishermen amounted to a total of 635,365 francs, and the bounties on the imports and exports of fish during that year amounted to 4,913,803 francs. These figures show that France is now giving over $1,000,000 per year to aid the fisheries carried on under the French flag.

The policy of granting construction and navigation bounties dates from 1881. The law of 1881 was in operation twelve years, during which time the French Government expended 31,500,000 francs for construction

bounties, and 89,250,000 francs for navigation bounties, the average annual payment during the twelve-year period amounting to more than $2,000,000. The results of the law of 1881 were, however, unsatisfactory, and the law of 1893 was enacted for the purpose of broadening the scope of Government aid to shipping.

One important feature of the law of 1893 was the heavy bounty granted to sailing vessels as contrasted with steamers. The effect of this was to cause sailing vessels to be built much more rapidly than steamers. The purpose of the discrimination in favor of the sailing vessel was to enable the sailing vessels to compete successfully with the steamers. The result of the law was unfortunate, because an increase in steamers was more to be desired than an increase in sail tonnage. To overcome this and other defects, and to broaden the scope of the law, the Act of 1902, the one now in force, was passed, the main provisions of which were as follows:

(1) Foreign-built ships were granted a shipping bounty called a *compensation d'armament*, which was practically a naval subvention. Foreign-built seagoing steamers of 100 tons or more gross register, admitted to French registry when not more than seven years old, were entitled to receive a shipping bounty as follows until the vessel reaches fifteen years of age: For each day the steamer is in commission, up to a maximum of 300 days per year, 5 centimes per day for each ton up to 2,000 tons; a vessel of 3,000 tons receives 5 centimes per day on the first 2,000 tons, and 4 centimes per day on the remaining 1,000 tons; a vessel of 4,000 tons receives 5 centimes per day per ton on 2,000 tons, 4 centimes per day on 1,000 tons, and 3 centimes per day on 1,000 tons; the rate on all tonnage above 4,000 tons is 2 centimes per day per ton.

(2) The navigation bounty granted to French-built

vessels of more than 100 tons gross and less than 15 years old, engaged in the foreign trade (*navigation au long cours*),[1] 1.70 francs per ton per annum, both for steamers and sailing vessels. The annual rate of decrease in the bounty depended upon the size of the ship, the materials of construction, and upon whether it was a steamer or sailing vessel.

(3) Vessels engaged in the international coasting trade (*cabotage international*) receive two thirds of the shipping bounty or navigation bounty.

(4) French-built vessels have the right to choose for each voyage whether to accept the shipping bounty or the navigation bounty.

(5) The bounties are granted upon a maximum tonnage of 500,000 gross tons of steamers, and 100,000 tons gross of sailing vessels, in addition to the tonnage existing at the time of the passage of the law. Of this additional 500,000 tons of steamers, not more than two fifths shall be foreign-built.

(6) In order for sailing vessels to receive the benefit of the law, they are obliged to have cargoes equal to at least two thirds of their net tonnage during at least two fifths of the distance of the length of their voyage.

(7) Five per cent of the bounties is to be retained by the Government for distribution among the crews, and six per cent of the bounties is to be paid as a contribution to the support of the marine hospital.

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[1] "*Navigation au long cours*, referred to in the various subsidy acts of France, includes voyages beyond the following limits: 30° north latitude, 72° north latitude, 15° west of Paris meridian, and 44° east of Paris meridian—that is, beyond ports of the Mediterranean, North Africa, and Europe below the arctic circle. *Cabotage international* includes voyages within the above limits, between French ports, including those of Algeria, and foreign ports; also between foreign ports. *Cabotage français* includes the ports of Algeria, and recently those of Madagascar." See Meeker, "History of Shipping Subsidies." 1902.

(8) The construction bounties remained the same as under the law of 1893, referred to in a previous chapter.

The law of 1902 is much more complex than previous statutes have been, and will call for an additional expenditure on the part of the Government.

The French Government is now contributing about $4,000,000 annually as construction, equipment, and navigation bounties. In addition to this, she pays an even larger sum to a limited number of companies for carrying the mails. The postal subventions amount to over $5,000,000, and although there are numerous contracts most of the services under the contracts are performed by two companies: the Messageries Maritimes, to which $2,406,568 are now paid annually, and the Compagnie Générale Transatlantique, the annual subventions to which amount to $1,289,240. The more important of these subventions are paid not only for the carrying of the mails, but to secure a higher speed and a more frequent service than the steamship companies would otherwise provide.

A good example of the purpose of the French postal subvention is afforded by the contract with the Compagnie Générale Transatlantique for the mail service between Havre and New York. The present contract was made in 1898, and became effective in 1901, to extend over a period of ten years. The company agrees to construct in French shipyards 3, and ultimately 4, 22-knot steamers for this service. It was also agreed by the company that if these steamers should, in 1905, prove to have a speed ten per cent less than the speed of competing lines, the company would, before 1908, build another steamer equal in speed and design to any competitor. Under the contract of 1898, the speed of the steamers for carrying the mails between Havre and New York was to average 17 knots, April 1, 1900; $17\frac{1}{2}$ knots, July 1, 1900; and $18\frac{3}{10}$

knots, April 1, 1903; upon putting the fourth steamer in service the average speed was to be 19 knots. The contract stipulates that if any vessel exceeds the annual average speed it shall be entitled to a speed subsidy of 25 francs per gross ton for every $\frac{1}{10}$ knot of excess speed. If the average speed is not attained, a penalty of 25 francs for each $\frac{1}{10}$ knot under the required speed was to be exacted. The payments under the contracts are to be 500,000 francs per year, with a maximum additional speed bounty of 1,680,000 francs during the ten years.

The postal subventions, together with the other large bounties granted by France to her shipbuilding and ocean navigation interests, exceed in liberality the payments made by any other country for similar purposes. The small results accomplished by this generous policy of Government aid indicate the disadvantageous conditions under which shipbuilding and the maritime industries of France are carried on in competition with her great rivals, the United Kingdom and Germany.

The foregoing detailed statement of the present bounties and postal subventions granted by the French Government in aid of shipbuilding and shipping has been presented because the French system of Government aid is more comprehensive than that of other European countries, and because the French bounty system has influenced the policy of Japan, and has attracted the favorable attention of the advocates of Government aid to American shipbuilding and shipping.

The Government aid to shipping given by the United Kingdom consists of appropriations for maintaining a force of naval reserves, of admiralty subventions paid to the owners of certain vessels, and of mail subsidies.

(1) In 1904–5 the British Government appropriated £319,954 (over $1,500,000) as "pay, allowances, and contingent expenses" of 33,505 officers and seamen serving

in merchant and fishing vessels; £70,795 ($350,000) as annual retainers, drill money, and lodging allowances to 14,609 men in the Royal Fleet Reserve—men who drill seven days a year in the fleet; and £19,000 to the 6,582 Royal Naval Volunteers, who receive per diem and capitation allowances. The appropriations of $2,000,000 annually, while intended primarily to provide a supply of seamen upon whom the navy may draw to obtain the crews to man the war vessels, are of much assistance to the merchant marine. The naval retainers make sea life a more attractive calling, and enable vessel owners to secure seamen more readily and probably at less expense.

(2) The admiralty subventions paid in 1904–5 applied to 18 fast steamers, and amounted to $360,000. In return for subventions paid during past years there are 30 additional merchant steamers held at the disposition of the Admiralty without further subsidy. These 48 merchant vessels had a gross register tonnage of 375,695 tons. The admiralty subventions granted from 1888 to 1903 included 35 vessels, whose owners received $3,500,000 for maintaining them and certain other ships in a condition such that the Government could readily convert them into auxiliary naval cruisers.

In 1903 the British Government made a special contract with the Cunard Company, whereby the Government, in return for a subvention of £150,000 ($729,000) a year for ten years, and for other assistance, acquired the right to purchase or lease any vessel owned by the company, and to supervise the plans of all new vessels with a speed of 17 knots or more which the company may construct. The company agreed to build, and is now building, two steamers that are to have a speed of 24 to 25 knots an hour. These steamers will cost about £1,300,000 each, and the Government is loaning the Company £2,600,000 ($12,660,000) at $2\frac{3}{4}$ per cent. The sub-

vention of £150,000 does not include the mail payments to the company, which remain as before.

(3) The mail subsidies constitute the largest Government aid given British shipping. Ever since the adoption of steam power for the transoceanic service, Great Britain has supported the strongest and fastest lines of steamers under the British flag with liberal mail contracts. From the beginning the mail payments have been to some extent subsidies granted for three purposes: (1) to secure more frequent and faster mail services to foreign countries, and to the British possessions, than could otherwise be secured; (2) to encourage the building of merchant vessels that may be of service to the Government in time of war; and (3) to strengthen British shipping, so as to enable it to meet the commercial competition of its rivals more easily. Great Britain has long recognized that her economic as well as her military progress is dependent upon success in developing and maintaining a large and prosperous merchant marine.

The recent maritime legislation of the United Kingdom has extended the subsidy principle. In order to develop the fruit trade from Jamaica to the British Islands, the British Government in 1900 made a contract with Elder Dempster and Company for a fortnightly steamship service between Jamaica and England. The steamers were to have a speed of 15 knots, to be capable of carrying 3,000 tons of cargo, each ship to be equipped for carrying 20,000 bunches of bananas. and each ship to have accommodations for 100 first-class and 50 second-class passengers. The company is also required, during the ten years of the duration of the contract, to purchase "not less than 20,000 bunches of bananas for each voyage from Jamaica." Another clause in the contract fixes the maximum passenger fares that may be charged. The company is, of course, required to carry the mails be-

tween Great Britain and Jamaica; but the mail service is not the main feature of the contract.

The agreement of 1903, above referred to, between the British Government and the Cunard Steamship Company provided for paying the company a large subsidy (1) to enable it to meet the competition of the powerful German lines, and (2) to keep the company a strictly British organization by inducing it not to consolidate with the International Mercantile Marine Company—an organization that united several American and British companies, was largely controlled by American capitalists, and had a close working agreement with the two great German lines. The British Government in 1903 selected a powerful steamship company and gave it strong support when the supremacy of British shipping on the North Atlantic was threatened, just as the Government had done with the same company fifty years earlier, when the Collins Line—an American steamship company—endangered the transatlantic maritime leadership of the United Kingdom.

The payments annually received by the British steamship companies for carrying the mail from the United Kingdom to foreign countries and between the United Kingdom and the colonies exceed $5,000,000. The British Government pays about four fifths of this sum, and the colonial governments the other fifth, the largest colonial payment being made by the South African colonies, from which the Union-Castle Line receives £135,000 ($656,100) annually. The British colonies also support British shipping by subsidizing services between the colony and foreign countries. Canada, for example, in 1904 offered to join with Mexico in granting a yearly subsidy of $105,000 for a monthly steamship service between Canadian and Mexican ports, there to be one line on the Atlantic and one on the Pacific. The same year Canada

joined with France in subsidizing a line of steamers—two under the British flag and two under the French—between Canada and France.

The German Empire aids its merchant marine by mail subsidies to secure services to Africa, Australia, and the Orient, and by preferential railway rates on goods exported by the German lines.

The North German Lloyd Company receives 3,290,000 marks ($783,020) for maintaining a service between Germany and Eastern Asia, including a branch Mediterranean line, and 2,300,000 marks ($549,400) for a service between Germany and Australia. The German East Africa Company obtains 1,350,000 marks ($321,300) for conducting a service between Hamburg and Cape Town and intermediate ports on both sides of Africa. Two other companies receive small mail payments—one company receiving 90,000 marks ($21,420) for a mail service between Cape Town and Australia, and another company 10,500 marks ($2,499) for running a line between Cape Town and German Southwest Africa. These mail contracts call for an annual payment of 7,040,500 marks (about $1,750,000). The German Government does not pay stipulated subsidies for its transatlantic service, but pays about one third of a million dollars annually to the North German Lloyd and Hamburg-American companies for carrying mail to America.

This brief statement of the payments made by the German Government for its ocean-mail service shows that the mail subsidies are confined to the lines running to Africa, Australia, and the Orient. The main purpose of the subsidies is to build up the African and Eastern trade of Germany. The policy of Germany, like that of Great Britain, has been to give most of its assistance to the strongest companies, and the policy has succeeded in extending the foreign trade of that country.

The development of the African and Levant trade of Germany, and, in consequence, the growth of the German merchant marine, have been aided by the reduced freight rates charged by the Government railways on goods for export by German vessels to East Africa and to the Levant. Goods are shipped on through bills of lading at greatly reduced rail rates from interior points in Germany to East Africa and to the countries adjacent to the eastern part of the Mediterranean, and to places on the Black Sea. The special rates granted on exports to the Levant and Africa are not the only concessions made in railroad charges by the German Governments to stimulate exports and imports; indeed, the tariff on many kinds of freight is adjusted by Prussia and the other German States so as to favor foreign trade.

Germany has made special and very successful efforts to create a vigorous shipbuilding industry. While foreign-built ships may be purchased and imported free of duty, and are admitted to German registry, the German-built ship is favored in numerous ways. All foreign materials imported for ship construction are exempt from customs charges; the railroad rates in Prussia on steel and other shipbuilding materials purchased in Germany are made especially low; the mail subsidies granted by the Imperial Government are limited to ships of home construction; and the extensive naval programme of Germany has been of great assistance to the shipbuilding industry.

The results of the shipbuilding and navigation policy of Germany have been successful. German shipyards are now turning out about 200,000 tons of steel merchant vessels annually, and the tonnage of steel steamers in the merchant marine has risen from less than 1,000,000 tons in 1890 to about 3,000,000 tons in 1905. The tonnage of steel shipping has trebled in fifteen years, and

both the shipbuilding industry and the merchant marine are now in a condition of healthy development. Moreover, these results have been secured without resort to general navigation bounties, and without large payments for mail subsidies. Moderate mail subventions, coupled with measures taken to aid shipbuilding and to extend and enlarge the foreign trade of the country, have proven to be adequate Government aid in Germany.

Japan is another country whose maritime policy merits consideration. At the close of the war with China, Japan decided to give liberal Government support to the development of a merchant marine, and in 1896 she adopted a policy of granting construction and navigation bounties. Her previous aid to ocean navigation had been confined to mail payments, which amounted to less than $500,000 a year.

The construction bounty granted to vessels of Japanese construction was 12 yen ($6) per ton on steel vessels of 700 to 1,000 tons register, and 20 yen per ton for larger vessels. A bounty of 5 yen per indicated horse power is also given to those vessels whose machinery is made in Japan. Up to 1904, 41 steel steamers, of 86,000 gross tons, had been aided by these construction bounties.

The navigation bounties provided for by the Japanese Act of 1896 granted to steamers owned by Japanese, and operated under the Japanese flag between Japan and foreign ports, a subsidy of 25 sen (about 12½ cents) per ton per 1,000 miles run for vessels of 1,000 tons and 10 knots speed. The subsidy increases with size and speed of the vessel up to a maximum of 60 sen per ton per 1,000 miles for steamers of 6,000 tons or larger having a speed of at least 17 knots. Foreign-built vessels less than five years old, as well as domestic ships, received the bounties. The subsidy is paid in full for five years, after which the

payments are reduced five per cent each year, and are terminated at the end of fifteen years. The bounties paid on navigation increased rapidly, and reached their maximum in 1899, when they amounted to $2,020,000; after that year, however, the navigation bounties rapidly fell off, because the Japanese Government passed a law in 1899 which provided for the substitution of a larger number of special subventions by contract with particular companies, to take the place of most of the general navigation bounties obtainable under the law of 1896. In 1902 the general navigation bounties amounted to only $160,000.

The policy of depending more largely upon special subsidies was adopted by Japan in 1899, because the navigation bounties of the law of 1896, although imposing a heavy drain upon the treasury of the empire, were not enabling the Japanese steamship companies to succeed satisfactorily in competition with foreign lines. The policy of making special contracts for specified services by selected routes has proven highly successful. Contracts have been made with 7 large steamship companies for services to America, China, Korea, Australia, India, and Europe. The contracts with these companies authorize a maximum Government subvention of over $3,000,000 annually. The largest contracts are with the leading Japanese steamship company, the Nippon Yusen Kaisha, which is granted a maximum subvention of $1,364,000 a year for operating 12 fast steamers on the European service, $91,000 for a service to Bombay, $268,000 for a line to Melbourne, $333,500 for a line from Hongkong to Seattle via Japan, and $280,500 for mail services to places in China and Korea. The next largest contract is with the Toyo Kisen Kaisha, which may receive a maximum of $517,000 for running 3 high-class steamers between Hongkong and San Francisco.

The Government aid now given the Japanese merchant marine amounts to between \$3,000,000 and \$3,500,000 annually, most of this relatively large sum being paid in special subventions to particular companies to secure the ocean transportation service of greatest importance to the commercial development of Japan. The tonnage under the Japanese flag is increasing rapidly. In 1895 the steam tonnage amounted to 331,374 gross tons; in 1903, to 632,742 tons; moreover, there has been a large increase in the number and tonnage of large steel steamers of over 4,000 gross tons.

### REFERENCES FOR FURTHER READING

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# CHAPTER XXII

## THE MERCHANT MARINE QUESTION

Bounties and subventions for the aid of navigation are of two distinct kinds: general navigation bounties, such as France gives, and special subventions, such as France, Germany, the United Kingdom, and Japan grant to particular lines of steamers to secure special services. General navigation bounties are subsidies, pure and simple, while special subventions are in part subsidies and in part payments for special and extraordinary services desired by the Government for postal, naval, and commercial reasons. The two forms of Government aid stand upon a different footing.

In favor of the policy of granting general navigation bounties, it may be argued: (1) That since the primary purpose of the bounty is to offset the economic and other disadvantages to which the shipping to be aided is subject, as compared with the foreign shipping with which competition must be carried on, the natural and surest way to equalize conditions is to aid all ships in the national marine, and to give them all the same measure of assistance. (2) In this way, moreover, Government aid will, it may be claimed, most surely contribute toward a well-rounded development of shipping—to an increase in passenger steamers, in cargo steamers, in sailing vessels, and in the fishing fleet. (3) A third argument for the general navigation bounty is that it does not

discriminate; it helps the weak as well as the strong; it treats all alike.

The Merchant Marine Commission of 1904 recommended both a general bounty on all shipping and special subventions to specified lines. The general bounty suggested was " an annual subvention of $5 per gross registered ton for every vessel, steam or sail, engaged for twelve months in the foreign trade or deep-sea fisheries, $4 for nine months, and $2.50 for six months." Vessels receiving the bounty were to be required to carry the mails free of charge, if desired, were to have crews containing a stipulated proportion of naval volunteers, were to be kept up to designated " ratings " (standards of excellence), were to be held subject to acquisition by the United States for naval purposes at any time upon payment to the owners of the " fair actual value," and were to make all ordinary repairs in the United States. In advocacy of this recommendation the commission stated: " It is to be noted that one even rate of subvention of $5 per gross ton is provided for all vessels, sail craft included. This is the fairest plan that possibly can be framed. It is simple and intelligible. It is proof against all charges of favoritism and discrimination."

There are, however, certain objections to general navigation bounties that weaken or overcome the arguments just advanced in their favor.

(1) In the first place, general bounties on navigation are subject to much the same criticism that was urged against construction bounties in a former chapter. The force of this criticism in the case of navigation bounties is weakened somewhat, it is true, by the fact that a large and prosperous merchant marine is of even greater importance than is a flourishing shipbuilding industry to the industrial, commercial, and military progress of a country.

(2) A country, with a relatively small shipbuilding industry, that is not able to compete with foreign shipyards in constructing merchant vessels for the world market, may yet be able to supply the domestic shipping interests with highly efficient vessels and also be able to construct war vessels of the highest type; but no country can become and remain a first-class naval power unless it has a large body of hardy seamen from which to draw its crews to man its war vessels; nor can a great commercial country, such as the United States has come to be, hope to extend its markets over the world in successful competition with its powerful commercial rivals, unless its merchants and producers are served by lines of mail and freight steamers connecting the United States with all the leading foreign centers of trade and production. This consideration, however, is rather an argument in favor of giving ocean navigation vigorous Government support than a justification of the policy of general bounties on all shipping.

(3) The third argument in favor of the general navigation bounty may be cited with equal force against that policy. From the standpoint of practical results, Government aid that does not discriminate between different kinds of shipping—that helps alike the weak and the strong—may well be criticised. The most certain method of increasing our merchant marine engaged in the international trade is to pick out the stronger lines of vessels and give them such assistance as will enable them to meet foreign competition successfully and to increase the tonnage of their fleets year by year. The way to get results is to strengthen the strong. Moreover, the weak are ultimately benefited by this policy—a fact well shown by what has taken place in Great Britain and Germany, where the plan of aiding a limited number of companies has prevailed. This fact is brought out by the Merchant

Marine Commission, and although the commission makes another application of the argument, the words of its report may well be quoted in this connection:

> It may be said that British "tramps" and German "tramps" receive no subsidy, and that they are numerous. That is true, but indirectly even the "tramps" are and have been sharers in the general policy of national encouragement. The first British "tramps" years ago were built in yards and engined by machine shops that had been created and developed by the parliamentary grant of subsidies to the Cunard Line, the Peninsular and Oriental, and the Royal Mail. These subsidies had an immediate and widespread effect upon the entire art of steamship construction in Great Britain, and gave that country at a critical stage an overwhelming advantage as against America.
>
> The same process is now under way in Germany. Yards which build the subsidized liners, and have their materials delivered at nominal rates by Government railways, are thereby powerfully encouraged to build "tramps" or cargo boats in the intervals when no liners are required. Moreover, the great foreign subsidized mail companies own, besides the ships that earn their subsidy, a very large amount of ordinary commercial tonnage which indirectly shares the benefit of the subventions. Thus, when the $1,100,000 subvention was recently awarded to the Cunard Line, that company was encouraged to construct not only the two great 24-knot ships, but several auxiliary vessels of moderate speed and heavy tonnage.

(4) The argument of experience is against the policy of general navigation bounties. The countries that have followed the policy of granting such bounties—France, Austria-Hungary, and Italy—have had but a small measure of maritime success in comparison with Great Britain and Germany, whose aid has consisted mainly of special subventions. The great maritime prosperity of the United Kingdom and Germany is, of course, due to economic causes quite as much as, or more than, to their shipping policies; and it is not asserted here that other countries

would have made large maritime progress had they adopted the policy of the United Kingdom or of Germany, nevertheless the presumption of higher merit is in favor of the policy of the countries that have had the greatest success.

Japan is the country that has made the most extraordinary maritime and naval progress during the past decade; and, as is characteristic of Japan in many ways, her shipping policy adopted in 1896 combines the important features of the policy of the United Kingdom, France, and Germany—construction and navigation bounties, and subventions to particular lines; but by far the larger part of the aid given is for subventions to special lines from Japan to Europe, to India, to Australia, to China, and from Hongkong to Seattle and San Francisco via Japan.

What maritime policy ought to be adopted by the United States? The Merchant Marine Commission of 1904 recommended a general bounty upon all shipping, and the subvention of lines of steamers over 10 routes in addition to routes now covered by contracts made under the Act of March 3, 1891. The 10 new routes would connect the Atlantic seaboard of the United States with South America and South Africa, our Gulf coast with South America, Cuba, Mexico, and Central America, and our Pacific ports with the west coast of Mexico, Central America, and Panama, and with Hawaii, Japan, China, and the Philippines. The adoption of the recommendations of the Marine Commission would doubtless bring about a large increase in our over-sea merchant marine, and cause an enlarged demand for ships built in American yards; but if the foregoing analysis of the arguments for and against general navigation bounties is accurate, the wiser policy of the United States would be to devote all its aid to subventions to secure special services.

By picking out the routes of most commercial impor-

tance to the United States and by giving enough aid to secure and maintain efficient steamship services over those routes, our Government can obtain immediate and definitely measurable returns for the public funds expended. By an annual expenditure beginning with about $5,000,000, and rising within a few years to about double that sum, the United States could bring about the establishment of a score of large steamship lines, connecting our ports with the main sources from which our imported foods are derived, with the countries from which our industries secure their foreign supply of materials, and with the chief markets for the sale of our exported products. The steamship lines thus established would, it is believed, grow stronger and increase the number and tonnage of their vessels with the growth of American commerce and with the development of economic conditions more favorable to the growth of shipping under our flag. In the progress of our maritime interests more is to be hoped for from promoting the growth of companies capable of maintaining well-organized and vigorous services than from scattering our Government aid over our entire registered tonnage.

Would an annual expenditure beginning with $5,000,000, and increasing to $10,000,000, be unwarrantably large for subventions to secure an adequate ocean transportation service for our foreign mails and our international commerce? In the chapter on "The Passenger and Mail Services," reference was made to the report of the Postmaster-General for 1905, which stated that "it is estimated that the sum of $6,219,299.25 was received by this department as postage on articles exchanged with all foreign countries, and that of that sum the postage collected on the articles exchanged with countries other than Canada and Mexico amounted to $4,711,215.03." The report further states that this sum "largely exceeds the

gross expense incurred" by the United States for transporting our foreign mails from the interior to the seaboard and across the ocean. It would seem wise to devote all our gross receipts from postage on foreign mail to the development of our merchant marine. If the gross receipts from our foreign postage should continue to increase at the rate they have risen during the past ten years they will amount to $10,000,000 a year by 1914.

The United Kingdom's contracts for carrying her ocean mails now call for the yearly payment of about $5,000,000, and her annual appropriations for "naval reserves" amount to about $2,000,000. In addition to these annual payments, there are the "admiralty subventions" given to 61 fast steamers, owned by 8 companies. These subventions from 1888 up to 1903 amounted to over $3,500,000, and had materially lightened the cost of constructing the ships. Since then the large additional subvention of £130,000 sterling (nearly $650,000), to be paid annually for ten years to the Cunard Steamship Company, has been made. The three kinds of Government aid—mail payments, subventions for naval reserves, and admiralty subventions—taken together make a total fully as large as the United States would need to spend to carry out the suggestion just made for assisting our merchant marine.

The Japanese Government is now paying about $4,000,000 a year to aid its shipping interests. Germany pays $2,000,000 a year to German companies for their mail service, and aids them in several other ways. France pays out nearly $9,000,000 a year for construction and navigation bounties and mail payments; but the returns from Government aid have not been so large in France as in other countries. Germany apparently obtained the best results of any country from the aid given to ocean shipping.

The facts presented in this chapter suggest that the United States might wisely adopt the following policy of aiding its over-sea merchant marine:

(1) Select the ocean-trade routes of most importance to the United States, and secure by liberal subventions the establishment on each route of a line of steamers capable of performing efficiently and adequately the services required for the transportation of our foreign mails and for the extension of our international commerce.

(2) The steamers on these lines thus aided should be required by law to be officered by American citizens, and to have crews containing a minimum of twenty-five per cent at the start, rising in five years to a minimum of fifty per cent, of American citizens. All American vessels engaged in our foreign trade, whether aided by a subvention or not, and all vessels engaged in our deep-sea fisheries, should be given an inducement to have officers and crews eligible for enrollment in the naval reserves of the United States. The bill proposed by the Merchant Marine Commission provided as follows for the creation of a naval reserve among the rank and file of merchant seamen:

The Secretary of the Navy and the Secretary of Commerce and Labor shall cause to be made an enrollment of officers and men now and hereafter employed in the merchant marine and deep-sea fisheries of the United States who may be capable of rendering service as naval volunteers in time of war. No man shall be thus enrolled who is not a citizen of the United States, or who has not declared his intention to become a citizen. Any naval volunteer who, having declared his intention to become a citizen, fails to complete his naturalization according to the provisions of title thirty of the Revised Statutes, shall be stricken from the rolls. These naval volunteers shall be enrolled for a period of three years, during which period they shall be subject to render service on call of the President in time of war. They shall also possess such qualifications, receive such instruction, and be subject to such

regulations as the Secretary of the Navy may prescribe. The Secretary of the Treasury is hereby authorized and directed, upon proper audit, to pay, out of the money in the Treasury not otherwise appropriated, to each officer or seaman thus enrolled and employed in the foreign trade or deep-sea fisheries, as hereinafter provided, an annual retainer as follows: For each master or chief engineer of a vessel of the United States of five thousand gross tons or over, one hundred dollars; for each master or chief engineer of a vessel of the United States of one thousand gross tons or over, but of less than five thousand gross tons, eighty-five dollars; for each master or chief engineer of a vessel of the United States under one thousand gross tons, seventy dollars; for each mate or assistant engineer of a vessel of the United States of five thousand gross tons or over, seventy dollars; for each mate or assistant engineer of a vessel of the United States of one thousand gross tons or over, but less than five thousand gross tons, fifty-five dollars; for each mate or assistant engineer of a vessel of the United States under one thousand gross tons, forty dollars; for each seaman, twenty-five dollars; for each boy, fifteen dollars. Such retainer shall be paid at the end of each year of service on certificate by an officer, to be designated by the Secretary of the Navy, that the naval volunteer has satisfactorily complied with the regulations, and on certificate by the Commissioner of Navigation that such volunteer has served satisfactorily for at least six months of the preceding twelve months on vessels of the United States in the foreign trade or in the deep-sea fisheries.

The retainers that would have been authorized by this bill—ranging from $15 a year for a boy, and $25 a year for a sailor or fireman, to $100 a year for the master or chief engineer of a large steamship—would have given a strong inducement to the owners of our merchant marine and fishing vessels to aid the navy by creating a force of naval reserves. The existence of a naval reserve of 20,000 men among the officers and crews of our fishing fleet and merchant vessels would add greatly to the naval strength of the United States. A million dollars a year would cover the expense of paying retainers to a naval

reserve of 20,000 men; and the money thus spent would be of much assistance to our merchant and fishing marines. The United Kingdom appropriates $2,000,000 annually for the maintenance of a naval reserve.

(3) The annual expenditure for the Government subvention of our merchant shipping in the manner suggested, and for the creation and continuance of a force of naval reserves, might warrantably reach a maximum of $10,000,000 a year. The expenditure by the United States Government during the next twenty years of its gross receipts from foreign postage, or a slightly larger amount, to build up the service of ocean transportation in American vessels, and thereby to enlarge our shipbuilding industry, would be a wise policy. The steady and sure development of the foreign trade and the naval strength of the United States is of such prime importance to our country that our merchant marine and our shipbuilding industry may well be given the moderate Government support that is here recommended.

### REFERENCES FOR FURTHER READING

"Development of the American Merchant Marine and American Commerce." Report of the Merchant Marine Commission, January 4, 1905. Senate Report No. 2755, 58th Congress, 3d Session.

See also references to the writings of Soley, Crowell, and Marvin, at the end of Chapter XX.

# CHAPTER XXIII

## THE FUTURE OUTLOOK FOR AMERICAN SHIPBUILDING AND MARITIME INTERESTS

WHAT is the outlook for the maritime industries of the people of the United States? Have we the ability to construct ships for the international trade, and shall we be disposed to devote our capital and our energies to ocean navigation; or are our maritime efforts to continue to be, as they now are, confined mainly to our coastwise and near-by foreign trade?

Up to the middle of the last century we were eminently successful upon the sea; whereas during the past fifty years our retrogression has been as marked as was our former progress. We have lost most of our international carrying trade, for reasons that have been explained. The purpose of this closing chapter is to inquire whether the basis as well as the superstructure of our maritime transportation business has been destroyed; whether present and prospective conditions indicate the growth or decay of our merchant marine and our shipyards.

Success in building and operating ocean ships depends upon four conditions: geographic, economic, political, and psychological. In forming an estimate as to the prospects of our maritime interests it is necessary to measure carefully the strength and limitations of each of the four bases upon which we must build for the future.

The geographic basis for the building of ships in the United States and for the development of our merchant

marine is broad and strong, and in this regard the United States compares favorably with any of its rivals. Our water frontage along the Northern Lakes, the Atlantic, the Gulf, and the Pacific, has the great length of 7,300 miles. Although a vast continental country, we have water frontage on all sides—north and south, east and west—and have ready communication by water with Canada, Europe, countries adjacent to the South Atlantic, and with countries about the North and South Pacific. The serious limitation now imposed by the American isthmus upon water commerce between the North Atlantic and the North Pacific is to be removed by the Panama Canal, now being constructed. When the isthmian waterway is opened each seaboard of the United States will enjoy economical ocean connection with both North Atlantic and Pacific countries. Our continental domain will have exceptional facilities for ocean commerce.

Our seaboards and our Great Lake frontage are well supplied with harbors. The best natural harbors are situated where the economic development of the country has been largest, and where the need of good harbors is greatest—along the Atlantic coast, from the mouth of the James River northward; along the Gulf coast, and on the Pacific coast at the Golden Gate; in the lower valley of the Columbia River, and about the shores of Puget Sound. Good harbors also exist at Charleston and Savannah, and, where necessary—as in lower California and about the Great Lakes—artificial harbors have been or are being constructed without difficulty.

A geographic fact of much importance to our shipbuilding industry is that the spacious Chesapeake and Delaware bays, the numerous other smaller bays and inlets of our North Atlantic seaboard, and the entire frontage of our Northern Lakes, are comparatively close to the iron and coal resources of the United States. The prox-

imity of coal and iron at Glasgow and Newcastle, in Great Britain, has greatly aided those cities in securing their prominence as shipbuilding centers. The shipyards along the Delaware and Chesapeake are not so close as Glasgow and Newcastle are to coal and iron, but the costs of rail transportation in the United States have been so reduced as in great part to overcome this slight handicap of the Chesapeake and Delaware shipyards. The American yards, however, have the advantage of abundance of natural deep-water frontage, whereas deep water in the Tyne, and especially in the Clyde, has been secured by extensive and costly dredging.

The acquisition of Porto Rico, the Philippines, and Hawaii, has changed the international position of the United States, and added another geographic factor favorable to the development of a larger American merchant marine. While our political and industrial interests were concerned solely with the progress of the United States on the continent of North America, where the different parts of our national domain, though of vast proportions, were everywhere contiguous, the reasons for building up an efficient merchant marine were less potent than they have become since the United States undertook the administration and development of over-sea colonies.

The increasing and unavoidable responsibilities of the United States as the leading nation upon the American continents are extending the range over which our political and economic influence must be exerted. This fact, quite as much as the possession of noncontiguous colonies, increases the value of having a domestic marine large enough to afford ready communication between the United States and the various American countries. The widening sphere of our international influence strengthens the geographic basis of our merchant marine quite as much as it necessitates the maintenance of a larger navy.

In general, the geographic conditions affecting the shipbuilding and ocean navigation interests of the people of the United States are favorable. If the geographic factor was alone determinative, we would unquestionably engage largely in the construction and navigation of deep-sea shipping; but there are other factors—economic, political, and psychological—that have checked our past progress on the high seas, and must be reckoned with in the future.

In considering the economic basis of shipbuilding in the United States the fact must be kept in mind that shipbuilding is a manufacturing industry, whose development in any country depends upon two prerequisites: the existence of material and social conditions that make possible the economical construction and operation of ships, and an increasing maritime commerce on the part of the country in question. Shipbuilders must be able to build cheaply and well, and there must be a steadily enlarging demand for the ships they construct.

The second of these two conditions antecedent to success in the shipbuilding industry obtains in the United States, whose coastwise and international maritime commerce has long been increasing, and will continue to grow with the assured industrial progress of the country. There is a growing demand on the part of the American people for ocean transportation; there is a large home market for American-built ships for both our foreign and domestic commerce, provided the vessels can be constructed as cheaply in the United States as abroad, and provided they can be operated under our flag as economically as under a foreign ensign. At the present time the economic and social conditions in the United States do not enable Americans to build and operate ocean vessels as economically as our foreign rivals can; consequently we have fallen behind in the international carrying trade. What prospect have we that present economic and social conditions will change?

In order to achieve industrial success a country must possess capital, and be able to employ the capital profitably. Industry, in general, is limited by the volume of available capital. Any particular industry is limited both by the general supply of capital and by the relative profitableness of that line of business as compared with other business activities.

Capital is now abundant in the United States, and is rapidly accumulating. We are not only paying back what we borrowed abroad a generation ago to use in building our railroads and opening up our natural resources, but we are investing our surplus in foreign countries where exceptional profits are obtainable. The development of shipbuilding in the United States, and the progress of our merchant marine in the future, will not be limited because of an inadequate supply of American capital.

Whether we shall invest our capital in shipbuilding and shipping will depend upon the relative profits to be derived from those and other industries. Since 1860, the people of the United States have been able to secure higher returns by using their capital in developing the unworked natural resources of their country, or in building up domestic industries protected by tariff duties from foreign competition, than they could obtain from building ships and engaging in ocean transportation. Unquestionably one effect of our protective system has been to accentuate the investment of capital behind the tariff *ægis*, instead of in industries such as ocean transportation, that cannot be shielded from the attacks of foreign competitors.

The general economic progress of the United States has doubtless been promoted by our tariff policy; but the wisdom of continuing the policy unmodified in the future is, at least, questionable. Indeed, it seems that the time has come when our national welfare can be enhanced by modifying our tariff system with a view to widening the

range of our industries and to creating more favorable conditions for shipbuilding and shipping. We should no longer permit our tariff laws to increase the cost of ships in the United States.

With capital abundant, and tariff restraints removed from the business of building ships, the profitableness and progress of the industry will depend upon the ability of the American builders to reduce labor costs and to increase labor skill. The entire history of American industry has been an unbroken record of success in devising such machinery and processes as were necessary to secure economical results. It seems hardly probable that the present higher labor costs in American as compared with foreign shipbuilding will long continue. Unless our future experience in building ships is to be unlike our past experience in other lines of heavy manufacture we shall eventually prove to be possessed of enough inventive ingenuity and of sufficient organizing ability to match our competitors in economy of labor costs.

The handicap of higher labor costs is the most serious present obstacle to the growth of American shipbuilding and the tonnage of our marine engaged in the foreign trade. In the case of the shipbuilding industry, the high labor costs are now due mainly to the fact that we are constructing a relatively small tonnage, particularly of passenger and cargo steamers. However, the output of our yards is increasing, and as it grows larger the labor costs will decline. Our present labor disadvantage will naturally tend to become less. If we can adopt measures that will enlarge our marine, and thus cause a larger tonnage of passenger and freight ships to be built in American yards, American builders will doubtless, in the course of a few years, be able to bring down labor expenses to approximately the level prevailing in foreign plants. When the American shipbuilding industry can be organ-

ized on the basis of large scale production it can and will meet foreign competition successfully.

The higher cost of operating vessels under the American flag than under some foreign standard presents the most difficult of all the economic problems to be solved in making possible the growth of the tonnage of our merchant marine. In time, the differences in the social and other conditions aboard American and foreign vessels will doubtless become slight, because the people of all nations will come to require practically the same treatment of the men who spend their lives at sea; but for some years to come the higher standards of living, and the higher wages prevailing in the United States as compared with Europe, will keep the operating costs higher for American than for foreign ships. Because this is so, the United States must, at least temporarily, give liberal aid to our maritime industry. The forms of State aid recommended in the previous chapters were special subventions to designated lines of steamers to secure special and additional services, and the payment of retainers to those officers and seamen who are enrolled as naval reserves.

The argument for Government aid, based upon the economic handicap to which the maritime industries are at present subject, is not the only argument that might be, or has been, advanced; there are strong naval and commercial reasons for aiding the merchant marine; but the above analysis of the economic status of our maritime industries shows clearly that State assistance in some form is necessary. For reasons that have been presented it is believed that wise methods of Government aid can and ought to be adopted by the United States.

The political forces and ideals controlling the national evolution of the United States are favorable to the development of American shipbuilding and shipping.

Fifty years ago sectional rivalries and animosities di-

vided our country into two nearly equal groups of people, and caused the people in each group to think rather of their section than of the country as a whole. Fortunately, the unity of the American people now makes possible the enactment of legislation to promote national aims. Neither sectional rivalries nor party differences are now apt to defeat measures of truly national import.

Moreover, our political ideals have become not only national, but also international. There has been a marked enlargement of our political horizon during the past decade. The opportunities and obligations of the United States are no longer thought to be limited to our home territory. Our long-cherished ideals of political isolation and economic self-sufficiency have been outgrown. We have come to control the destinies of Latin America, and are finding ourselves obliged to assume increasing responsibilities not only in maintaining order among the Latin republics, but also in administering their finances. Few Americans welcome this rapid growth in our international duties, and yet no patriotic citizen desires our country to shrink from carrying its international burdens. The feeling of the American people in this regard was accurately described by President Roosevelt, in his Annual Message to Congress in December, 1905. "We must ourselves," he said, "in good faith try to help upward toward peace and order those of our sister republics which need such help. Just as there has been a gradual growth of the ethical element in the relations of one individual to another, so we are, even though slowly, more and more coming to recognize the duty of bearing one another's burdens, not only as among individuals, but also as among nations."

Our international influence has become broader than our duties under the Monroe Doctrine. We have become potential in the affairs of the East, and the service of the President of the United States in bringing about peace

between Russia and Japan shows that European countries may in the future, more than in the past, desire the friendly coöperation of the United States in dealing with great international problems.

This enlargement of our political influence is compelling us to increase the size of our navy, and both our larger navy and our increasing international responsibilities emphasize the importance of having an efficient merchant marine. Our international relations and our larger navy, as well as our enormous and rapidly expanding foreign trade, argue in favor of a larger tonnage of merchant shipping, and are likewise establishing conditions which render an early development of our shipbuilding and shipping more probable.

Is there the necessary psychological basis for the development of the American maritime industries? Do the people of the United States really want to be successful at sea? Have they the aptitude and the hardihood required for success on the ocean? Our history for the two hundred and fifty years from the beginning of the seventeenth century to the middle of the nineteenth century gives a clear answer in the affirmative. The analysis, presented in a previous chapter of this volume, of the causes accounting for the decline, since 1860, of our merchant marine engaged in the foreign trade, shows that the withdrawal of our capital from over-sea shipping was due to the exceptional industrial opportunities within the United States, and not to any inaptitude on our part for maritime enterprises, or any disinclination to engage in seafaring pursuits.

The fundamental traits of the American people have not changed during the past hundred years. The blood of our forefathers courses in our veins, and when the economic influences affecting our chances of maritime success become more favorable, either as the result of a gradual

change in the general economic and social conditions prevailing in the United States, or as the result of legislation enacted to lessen or remove the present hindrances to American shipping and shipbuilding, we shall see Americans devoting their capital, their energy, and their skill to the construction and navigation of deep-sea shipping with all the persistence, valor, and success that characterized the hardy masters and seamen who, fifty and a hundred years ago, made the American flag a familiar sight in all the ports of the world.

# *BOOK TWO*

# *CANAL, RIVER, AND LAKE TRANSPORTATION*

## CHAPTER XXIV

### THE INLAND WATERWAYS IN THE UNITED STATES

In a country such as the United States, whose territory is of such continental proportions, the volume of its internal trade and transportation is far greater than its foreign commerce and ocean transportation. The domestic commerce of the United States is vast not only because our country is large, but also for the reason that the products of American industries consist mainly of bulky commodities which, because of our territorial specialization in production, must be transported long distances. Three fourths of the iron ore mined in the United States —and our country leads all others in the production of iron—comes from the region about Lake Superior, and most of the ore is carried a thousand miles to be smelted in Ohio, Pennsylvania, and New York. The cotton, lumber, and fruit of the Southern States are shipped North in large quantities. The grain, flour, provisions, and wool from the trans-Mississippi States are shipped 1,500 miles to Eastern markets. The lumber, fruit, fish, and grain from the Pacific Coast States are marketed not only in the adjacent mountain States, but also in the Mississippi Valley and in the East.

The home trade of the United States is comparable with the combined domestic and intra-European commerce of all the countries of Europe, rather than with the internal trade of any one country of that continent. The interstate commerce of such States as Massachusetts, New

York, Pennsylvania, Ohio, and Illinois exceeds the international trade of the smaller European countries. The exact volume of our interstate and State traffic is not known, but it is estimated to be twenty times the amount of our large foreign commerce.

The major share of the tonnage of our great internal trade is carried by the railroads, the mileage of which in the United States is greater than the mileage of all Europe; but our inland waterways, especially the Great Lakes, perform an important service as carriers of freight and regulators of railway charges. Previous to about 1850 the industries and commerce of the United States depended mainly upon the waterways for long-distance transportation, but with the spread of our railway net over the entire country the traffic of most of the inland waterways has declined. The railroads have been able to supply most sections of the country with adequate and sufficiently economical transportation facilities. Whether, with the growing density of population and with the great progress of our industries, there is again arising a need for water transportation facilities—a need for both water and rail transportation—is a question upon which the following pages should throw some light.

Although the United States includes an unbroken expanse of territory stretching 3,000 miles from east to west, and half that distance from north to south, the country possesses a large mileage of navigable waterways. The Great Lakes along our northern boundary constitute an unrivaled inland waterway extending nearly halfway across the continent, and, in the case of Lake Michigan, reaching several hundred miles into our territory. The Mississippi River and its tributaries comprise 16,000 miles of navigable waterways, the river route from Pittsburg to New Orleans—the most-used waterway in the Mississippi basin—being 2,200 miles in length. Many of

the streams flowing into the Atlantic and Gulf, and the great Columbia River in the Northwest, are navigable not only to the head of their tidal reaches, but also in their middle courses.

The inland waterways of the United States may be divided into three classes:

(1) Lakes, of which there are thousands, large and small, within our limits, but the only ones of great commercial importance are the five Great Lakes along our Canadian boundary.

(2) Rivers, which consist of three natural groups: those tributary to the Atlantic, the Gulf, and the Pacific. The streams flowing into the Great Lakes are small, and the outlet of the lakes, the noble St. Lawrence, although it flows along our boundary for some distance, is a Canadian waterway. The rivers tributary to the ocean may furnish a waterway for one or both of two distinct kinds of navigation and shipping, for ocean-going vessels and for the steamboats and barges that navigate the river only. The deep-water or tidal sections of rivers are the harbors of seaports, or the channels between the harbors and the sea; their place in ocean transportation, and the different methods by which they are made more serviceable to commerce, were considered in Book One. It is mainly as agencies for inland navigation that the rivers of the United States will be considered in the following pages.

(3) Canals, which are the artificial waterways constructed either to connect separated rivers, lakes, or arms of the sea, or to lengthen a natural watercourse. The most important inland canals are those connecting natural waterways largely used for commerce. Canals connected with natural inland waterways are of two general types: those so constructed as to be used by the vessels operated on the waterways connected, and those usable only by barges and tugs. Canals like those at Manchester, Kiel,

Corinth, Amsterdam, and Suez are segments of ocean routes, and need not be considered in discussing inland waterways.

All of these various classes of inland waterways exist in the United States. It will be convenient to describe our facilities for river navigation first, and then to consider our lakes and canals. The description of each must needs be brief. The reader will do well to supplement this account by studying a good contour wall map or a large scale atlas of the United States.

The Atlantic slope of the United States is drained by numerous rivers, and the majority of them are navigable for a greater or less portion of their courses. In New England the principal streams are the Penobscot, Kennebec, Saco, Piscataqua, Merrimac, Thames, Connecticut, and Housatonic. The rivers of New England, with the exception of the Connecticut, are not navigable to much extent above their tidal sections, because of the numerous waterfalls in their courses. The middle and upper reaches of the streams can be used to raft lumber and logs, and can be navigated by small boats to some extent, but these rivers do not furnish facilities for much systematic navigation above tidewater.

The Hudson River has the largest traffic of any stream tributary to the Atlantic. The Atlantic tides extend to the head of navigation of the river at Troy, 170 miles from the sea. The natural depth of the river up to Coxsackie, 28 miles below Troy, was 12 feet or more; from there to Albany 11 feet, while above Albany the channel, narrow and crooked, decreased gradually in depth to a minimum of 4 feet at Troy. In 1899 Congress authorized a project for a 12-foot channel from Troy to Coxsackie, and vessels now load to a draft of 10 feet at low water. The Hudson River is navigable for several miles above New York City for ocean-going ships, and is navigated

by three classes of vessels: ocean ships, river steamers, and canal barges.

The Delaware, Susquehanna, Potomac, and James rivers are not navigable above tidewater. Each of these rivers crosses the "Fall Line"—the line separating the old Archæan rock from rocks of the geological period which make up the Atlantic coast plain—by a series of falls that separate sharply the tidal sections of the rivers from the middle courses of the streams. The Fall Line in the case of all these rivers is over 100 miles from the sea, and the United States Government has made the Delaware, Potomac, and James rivers navigable for large ocean-going vessels. The navigation of the Susquehanna River ceases shortly above Havre-de-Grace, where the river widens into Chesapeake Bay. This bay has numerous affluents from Maryland and Virginia that are of commercial importance. It will, however, suffice to mention only the York River, Virginia, which is navigable for a distance of 41 miles by vessels of 20-feet draft, and the Rappahannock River, which may be navigated by vessels of 9-feet draft up to Fredericksburg, 106 miles from the mouth of the stream.

From the mouth of the James River, Virginia, to the St. Johns River in Florida is a succession of rivers, most of which have been so improved as to be navigable for from 100 to 300 miles from the sea. These streams were formerly of greater value to trade than they now are, because the railroads now carry much of the traffic that was formerly transported on the rivers. However, they are still of value to commerce, and are regulators of the railway rates to practically all the important points within 200 miles of the Atlantic seaboard. Some rivers are still used by a moderately large volume of traffic, notably the Pamlico, Tar, Cape Fear, Neuse, and Trent rivers of North Carolina. The Waccamaw, Little and

Great Pedee, Santee, Ashley, and Edisto rivers of South Carolina are of sufficient use to navigation to warrant mention. The Savannah River, separating South Carolina and Georgia, and the Occomee and Altamaha rivers of Georgia, are streams on which there is regular traffic. The St. Johns River of Florida has been made navigable for ocean vessels up to Jacksonville, 27½ miles from the sea. Above Jacksonville the river accommodates large river steamers as far as Palatka. Although Florida has numerous other rivers of some use to commerce, mention need be made only of the Suwanee, Appalachicola, and Escambia.

Alabama has an important river system which reaches the Gulf via Mobile Bay. The Tombigbee and Alabama rivers, which unite to form the Mobile River, are of such commercial importance that the United States Government is improving and extending their watercourses with a view to giving a better outlet by water to the cotton, lumber, coal, and iron of Alabama.

The Mississippi and Ohio rivers, with their numerous affluents, form a system of inland-river navigation rivaled only by the great Amazon River system. The 16,000 miles of navigable waterways draining the great central portion of the United States have been of enormous importance to the settlement and development of our country, and although our extensive and efficient system of railways has lessened the importance of river transportation, our country possesses in this system of inland waterways a natural resource of great value, destined to become of increasing economic importance with the future growth in density of population, and in the diversification of industry in the great Mississippi Valley section of the United States.

The Mississippi River is navigable, during ordinary stages of water, for large river steamboats and large

barges up to St. Louis. The head of navigation of the river is at the Falls of St. Anthony, at St. Paul, the use made of the river above St. Louis being about equal to that below St. Louis.

The Ohio River has a larger traffic than the Mississippi, because of the enormous tonnage originating at Pittsburg and along the Monongahela and Allegheny rivers above that city. The Great Kanawha River of West Virginia also contributes largely to the traffic of the Ohio, and the Kentucky and Greene rivers, as well as the Cumberland, Tennessee, and Wabash, also add to the freight moved on the Ohio. The Missouri and Arkansas rivers, formerly largely used, are now only of moderate use to commerce; the same is true of the Illinois, and many other rivers tributary to the Mississippi.

California has only one important system of navigable rivers, and that is the one which discharges its waters into San Francisco Bay. The San Joaquin, flowing northward in the great valley of California, and the Sacramento, draining the northern portion of the same valley, are navigable, and form an outlet for the products of the California Valley.

The great river of the Pacific coast is the Columbia. The city of Portland, on the Willamette, 110 miles from the ocean, has a channel to the sea 25 feet deep, and the city is one of the important and rapidly growing Pacific Ocean ports. The navigation of the Columbia River, until 1896, was obstructed by the falls in the river at the Cascades, where the river breaks through the Cascade range. By means of a canal and locks this obstruction to the river was overcome, and then the stream became navigable up to the rapids at The Dalles, about 250 miles from the sea. At present, cargo is transported around these rapids in the river by means of a portage road. The United States, however, has recently begun the construc-

tion of a system of locks, which, with a canal about 5 miles in length, will give an all-water route from the mouth of the Columbia to Priest's Rapids, in Washington, about 530 miles from the ocean. The Snake River is navigable for about 200 miles, and when the present improvements of the Columbia are completed the traffic of southeastern Washington and northern Oregon will have an efficient water highway to and from the sea.

The Willamette River is navigable for about 140 miles, and affords water transportation for the important valley which it drains in western Oregon. The obstruction of the stream at its falls, 12 miles south of Portland, is overcome by a set of locks now under private ownership, but which the State contemplates taking over for the purpose of making the Willamette more serviceable to commerce.

Puget Sound, although an arm of the sea, provides a magnificent waterway that reaches far inland. Several of the streams flowing into Puget Sound are navigable for some distance from the Sound.

This brief account of the river waterways in the United States gives a very general and incomplete picture of the present and possible facilities for inland navigation in our country. One who is not familiar with the number and length of our navigable waterways will find the annual report of the Chief of Engineers of the United States Army a revelation. This thick volume discusses in some detail each of the navigable waterways in our country, and the student will find that there are scores of rivers of which he may never have heard that are considered by the United States Government of such commercial importance as to warrant improvement.

The greatest inland waterway of the United States, and unquestionably of the world, is that afforded by the five Great Lakes on our northern boundary. Lake On-

tario, 195 miles in length; Lake Erie, 240 miles long; Lake Huron, with a length of 280 miles; Lake Michigan, 335 miles in length, and Lake Superior, 360 miles long, have a total navigable length of 1,410 miles. The broad St. Lawrence River, which discharges more water into the sea than is discharged by any other stream of North America, connects these great lakes with the sea by a waterway which is available for vessels of 14-feet draft from Lake Ontario to Montreal. Below Montreal the channel is deep enough to accommodate large ocean vessels. Although the St. Lawrence lies mainly in Canada, it forms the boundary between the United States and Canada for some distance, and is serviceable both to American and Canadian commerce. This waterway of the Great Lakes and the St. Lawrence has a total length of 2,000 miles, and is of incalculable service to the industries and trade of Canada and of the United States.

Before improvements were made, the harbors and some of the connecting channels of the Great Lakes were but a few feet in depth. In the seventies the United States Government deepened the harbors and connecting channels to 12 feet; in the eighties the plan of securing 16 feet of water was carried out; and in the nineties the present channels of 21 feet in depth were provided. Not all of the harbors of the Great Lakes will accommodate vessels of 20-feet draft, but all connecting channels will, and the commerce of the Great Lakes is carried in ships drawing from 15 to 20 feet of water. The Welland Canal, connecting Lake Erie and Ontario, has a depth of only 14 feet, and the same is true of the canals around the rapids of the St. Lawrence between Lake Ontario and Montreal. The Canadian Government will undoubtedly be obliged, in the future, to increase the dimensions of the Welland and St. Lawrence canals.

The rivers flowing into the Great Lakes are nearly all

short, and without commercial significance except as they provide harbors. Most of the Great Lakes ports—Chicago, Milwaukee, Toledo, and Cleveland—are located at the mouths of small streams, and their harbors consist partly of the dredged mouths of the rivers, and in part of small areas of the lake protected from storms by breakwaters.

There are two general classes of canals: those constructed to improve the navigation of a river or lake route, and those built to connect separated waterways. The United States at the present time is operating a large number of canals of the first class, and is constructing numerous inland canals of this type in connection with the canalization of several of our important rivers. Such streams as the Columbia, Ohio, Warrior, and Illinois, and many others, are having their navigable courses lengthened and improved by means of locks and short canals. Up to the present time the United States has done but little to connect the separated systems of inland waterways in the country by means of canals of the second class. Although frequently urged by different sections of the country to undertake the construction of such canals, the Federal Government has thus far left most of that work to the States. The only important canal of this type now being constructed by the United States is the Illinois and Mississippi, or the Hennepin Canal, which will soon provide a 7-foot waterway, 97 miles in length, between the Mississippi River and Rock Island, on the Illinois River, at its great bend just above the town of Hennepin.

During the first half of the last century numerous canals were constructed in the United States by the States, or by corporations, most of whom received more or less public aid. According to the census of 1880, 4,468 miles of canals had been constructed in the United States, at a

total cost of $214,000,000. As early as 1880, two fifths of the total mileage had been abandoned, and a considerable portion of the canals in operation in 1880 have become of less importance now than they were then. The canals now actually in operation do not exceed 2,000 miles in length. Of the many States that constructed canals, New York, Maryland, Ohio, and Illinois are the only ones now owning and operating such waterways. The location of New York State, between the Great Lakes and the Hudson River and North Atlantic seaboard, is such that the interest of that State in canals would naturally be greater than any other State. Illinois, being located between the Mississippi River and Lake Michigan, is a State whose position would cause it to be especially interested in canal navigation.

The State of Ohio lies between the Ohio River and the lakes, and until railroads demonstrated their ability to handle heavy traffic economically over the mountains between the Ohio Valley and the seaboard, it was supposed that the traffic of the Ohio River would be obliged to find an outlet by canals from the Ohio by way of Lake Erie, and the Erie Canal, to the seaboard. The efficiency of the trunk line railroads as carriers of heavy freight has caused the canals extending north and south across the State of Ohio to be chiefly of local importance. The canals in Ohio that have not been abandoned are now maintained and operated by the State Government.

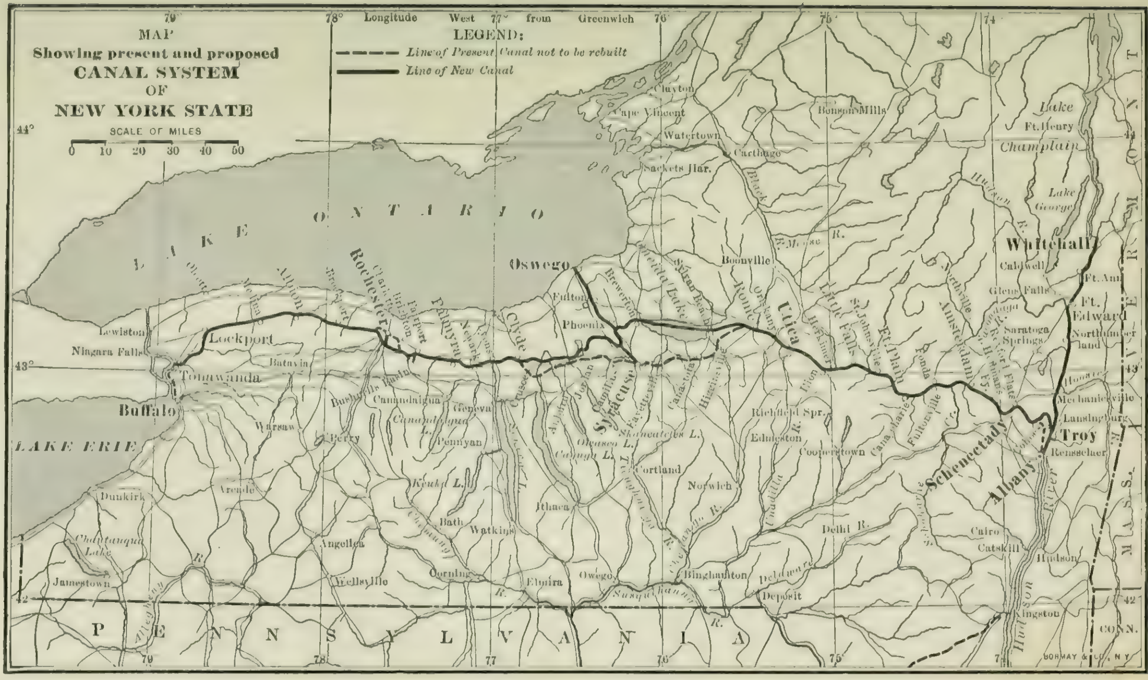
There are two general canal routes across the State of Ohio. The Ohio Canal extends from Cleveland, on Lake Erie, to Dresden, in the central part of the State, from which point there are two routes, one connecting with the Ohio River at Marietta via the improved Muskingum River, and the other connecting with the Ohio at Portsmouth via the Licking and Scioto rivers. This latter route also has a branch canal down the Hocking River Valley.

The Ohio Canal, from Cleveland to Dresden, is to be improved with a view to securing an efficient water route via this canal and the Muskingum River, the improvement of which is in charge of the United States Government. The Miami and Erie Canal connects Cincinnati with Toledo via the Miami and Maumee rivers.

It seems probable that a canal of large dimensions will soon be constructed between Lake Erie and Pittsburg. The enormous inbound and outgoing traffic of the Pittsburg district would provide such a waterway with a heavy tonnage. A private company in 1906 secured from Congress a charter to build this canal, a Federal charter being required because the waterway will be located partly in Pennsylvania and partly in Ohio.

The Erie Canal, completed in 1825, has always been the most important canal in the United States. Until 1880 it was used by a steadily increasing volume of traffic, and it has, until within a few years, regulated the rates charged by the railroads on freight between the upper Mississippi Valley and the seaboard. After neglecting the Erie Canal for many years, the State of New York, in 1903, decided to spend $100,000,000 in enlarging and improving the Erie, Oswego, and Champlain canals. The work of reconstructing these three canals is now in progress, and they are being made waterways of 12 feet in depth and 75 feet in width at the bottom. The locks are to be 328 feet long, with a clear width of 28 feet and a minimum depth of 11 feet. After the improvements are completed the New York waterways will accommodate barges carrying 1,000 tons, and propelled by mechanical power at a speed of 6 miles or more an hour.

Whether the Great Lakes and the Mississippi are to be connected by an efficient waterway is still an undecided question. The old Illinois and Michigan Canal, extending from Chicago to La Salle, on the Illinois River, is an anti-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Lockport
Albion
Rochester
Palmyra
Newark
Clyde
Oswego
Syracuse
Utica
Rome
Little Falls
Ft. Plain
Amsterdam
Schenectady
Albany
Troy
Whitehall
Lake Champlain
Lake George
Watertown
Ithaca
Binghamton
Elmira
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CONN.
BORMAY & CO., N.Y.

quated barge canal 6 feet in depth and 60 feet wide, with declining tonnage. For some years the systematic agitation for the enlargement of this canal by the United States Government has been in progress. The United States will soon complete the Hennepin Canal; the Illinois River is being canalized by the United States, and provided with the locks and channel required for a depth of 7 feet at low water, and the city of Chicago has connected Lake Michigan with the Des Plaines River (an affluent of the Illinois River), with a drainage canal 20 feet in depth. Meanwhile, the United States Government is going ahead with the improvement of the Mississippi River navigation. The carrying out of these plans suggests that the time can hardly be far distant when the people of the United States will decide to connect our two greatest systems of inland waterways with an up-to-date canal capable of accommodating a large tonnage of traffic.

The construction of canals for the purpose of connecting our main inland waterways with each other and with the sea has received comparatively little attention in the United States since the development of our railway system rendered unimportant most of the canals that have been constructed by the States. The growing density of population in the United States and the development of our industries are now suggesting the desirability of constructing several canals for the purpose of giving our more important industrial centers the advantage of both rail and water transportation. European countries have found it to their advantage to provide facilities for both rail and water transportation. It seems probable that the American people will, as time goes on, connect the Great Lakes and our largest rivers with some of our industrial centers by means of canals that can accommodate barges carrying 1,000 or more tons of traffic.

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# CHAPTER XXV

## THE IMPROVEMENT AND MAINTENANCE OF INLAND WATERWAYS IN THE UNITED STATES

The natural inland waterways in the United States are declared by law to be "navigable waterways of the United States," and are under the control of the Federal Government. The improvement of these natural waterways is now made by Congress, and any State desiring to improve, regulate, or bridge a "navigable waterway" must submit its plans to the Secretary of War and the Chief of Engineers of the United States Army for approval, unless the waterway in question lies wholly within a single State, and does not connect with another river that passes the State boundary. Likewise, when a State constructs a canal that may be used for interstate commerce, the waterway becomes subject to Federal regulation.

The National Government has, partly for constitutional considerations, but principally for reasons of economy and expediency, thus far left the construction of canals mainly to the States, but the constitutional reasons against canal construction by Congress within a State are no longer urged; and as there is an increasing tendency on the part of the United States to bring all interstate waterways under its supervision, we may expect the United States to construct most of the canals that will eventually be built to connect such parts of our extensive system of waterways as need to be coördinated in order to

round out our facilities for inland navigation. At the present time the State of New York is reconstructing its canals, and the United States is building a canal in Illinois, the work of canal building being now carried on both by National and State authority.

The construction of canals began in the United States at the close of the War of 1812–15, at a time when the need for additional transportation facilities was made urgent by the spread of population and the development of our mining and agricultural resources. The railroad was not introduced until about 1830, and it was not until about 1850 that the railroad demonstrated its ability to transport heavy freight cheaply enough to be able to handle the traffic for which the canals had been and were being constructed.

The early canals, those constructed between 1815 and 1835, were built mainly to accomplish two purposes: to connect the anthracite coal fields with the seaboard, and to connect the Atlantic coast with the lakes and the Ohio River, and thus with the great Mississippi Valley. The canals from the anthracite coal fields to seaboard points included those paralleling the Lehigh and Schuylkill rivers to their mouths, and the Delaware River from the mouth of the Lehigh to Bristol, Pa.; the Delaware and Hudson Canal from Honesdale, Pa., to Rondout, on the Hudson River; the Morris Canal from Easton, on the Delaware, to Jersey City; and the Delaware and Raritan Canal, from the Delaware River, at Bordentown, across New Jersey to New Brunswick, on the Raritan River. Baltimore was reached from the coal fields via the canals down the Lehigh, Schuylkill, and Delaware rivers, and the canal connecting the Delaware and Chesapeake bays. Baltimore also had the advantage of a water route from central Pennsylvania via the Susquehanna and Tidewater Canal, which, however, was used more generally for the

shipment of general merchandise than for the shipment of coal.

The canals to connect the Atlantic seaboard with the trans-Alleghany region were undertakings too large to be carried through by corporations. The State of New York, between 1817 and 1825, built the Erie Canal and numerous lateral feeders to this trunk line water route between the Hudson River and the Great Lakes.

The activity of New York caused Pennsylvania, in 1825, to begin the construction of a rail and water route connecting Philadelphia with the headwaters of the Ohio River. This route comprised a railroad from Philadelphia to the Susquehanna River, a canal up the Susquehanna and Juniata valleys to Hollidaysburg, a portage railway for the transportation of the canal boats over the mountains to Johnstown, and a canal from Johnstown to Pittsburg. This composite route was opened in 1834. The State works of Pennsylvania comprised altogether nearly 600 miles of canals.

The city of Baltimore and the States of Virginia and Maryland, from the days of George Washington on, had been desirous of securing a waterway via the Potomac to the Ohio. Various difficulties kept the work from making much progress until 1828, when the Chesapeake and Ohio Canal Company, aided by the State of Maryland, actively began the work of construction. It was not, however, until 1851 that the canal was opened to navigation from Georgetown to Cumberland. The State of Maryland did not succeed, as did New York and Pennsylvania, in securing a through route by which traffic could be shipped without breaking bulk from tidewater to the lakes and the Ohio. The Baltimore and Ohio Railroad, which reached the Ohio River in 1851, provided the first facility for through shipment between Baltimore and the region beyond the Alleghanies.

To give an account of the activity of Virginia, Kentucky, Ohio, Indiana, Michigan, and Illinois, and the various other States that engaged in canal building, would require more space than is available in this volume. Students of the history of American canals will find an account of that history recorded in Volume IV of the "Tenth Census of the United States." Most of the States engaged more or less extensively in canal building between 1815 and 1850, with results that were usually unfortunate. Lack of experience in canal building caused engineers to underestimate expenses in most instances; the traffic and the revenue to be derived were frequently overestimated; many canals were located where, as subsequent events proved, the railroad would have provided a better service at less capital cost; and, what was worst of all, the majority of the States adopted unsound financial methods which could hardly have led to other than disastrous consequences. Taken all in all, the experience of our States in carrying out works of "internal improvement" constitutes one of the most regrettable chapters of American history.

The States having failed in the majority of their canal projects, sold or abandoned numerous routes, and canal building, where possible, was stopped by most of the States by about 1850. Many States substituted railroad building or public aid to railroads, in place of canal enterprises; and the railroads built by private corporations, aided to a large extent by the States and by Congress, rapidly supplied the transportation services for which the canals had been desired. The original canals all became technically antiquated, and only those so located as to be of exceptional commercial importance were enlarged and improved to meet the increasing requirements of commerce. For nearly fifty years canal development was neglected in the United States. However, the recent revival of interest in

canals in New York and Illinois suggests that the States and the United States will in the future provide our country with such canals as are needed to make our natural waterways more serviceable.

At the same time that the States began to give active support to the improvement of rivers and the construction of canals, efforts were made to have the United States adopt a policy of giving liberal support to the improvement of our inland waterways. The influence of Gallatin during Jefferson's administration, and of Henry Clay and other leaders of the Whig party in John Quincy Adams's administration, would doubtless have caused the United States Government to enter extensively upon the execution of works of "internal improvement," had it not been for the opposition of the Democratic party, which was in control of the National Government most of the time from 1830 to 1860. Some aid was given by the United States Government toward the improvement of rivers and the construction of canals before the Civil War, but the activity of Congress in the development of inland water navigation was not important until about 1870, from which time the River and Harbor Bill in its present form dates.

The items included in the River and Harbor Bill cover appropriations for harbors as well as for inland waterways, and the bill makes appropriations for several hundred works. The United States Government is now spending $25,000,000 a year, on the average, in the improvement of its harbors and inland waterways. During the ten years ending in 1900, the appropriations for this purpose amounted to a total of $167,004,217. Inasmuch as the total appropriations for rivers, harbors, and canals from the time of the first act in 1802 up to and including 1900 amounted to only $370,411,124, it will be seen that the appropriations now being made far exceed those that were made in former years.

Although a large number of streams of minor importance are being improved by Congress, most of the money is spent upon the more important rivers, such as the Mississippi, Missouri, Ohio, Hudson, and Columbia, and upon the improvement of the harbors and channels of the Great Lakes. These improvements are in charge of the Corps of Engineers of the United States Army. The improvement of the Mississippi River is a work of such magnitude and importance that it is in charge of a special commission. For a time the Missouri River was in charge of a similar commission. In the case of most enterprises, Congress, after authorizing their execution, makes partial appropriations year by year sufficient only to carry on the work for a year. Beginning with 1890, however, Congress wisely adopted the plan of placing the larger works, such as the improvement of the Mississippi and Ohio rivers, and the enlargement and deepening of our largest seaports, upon the "continuing contract" basis. In the case of the projects placed upon this basis, Congress gives power to the Secretary of War to make contracts for the execution of the entire project as authorized, and the appropriations for carrying on the work are made as required.

REFERENCES FOR FURTHER READING

For an account of each of the river and harbor improvements now being carried on by the United States Government, the student is referred to the current "Annual Report of the Chief of Engineers of the United States Army."

A table including every act of Congress, making appropriation for the improvement of rivers and harbors may be found in Volume II of the "Index to the Reports of the Chief of Engineers, United States Army, 1866–1900." (This compilation was made by Lieutenant-Colonel C. W. Raymond, Corps of Engineers, United States Army.)

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# CHAPTER XXVI

## THE ORGANIZATION OF THE SERVICE AND THE EQUIPMENT EMPLOYED ON INLAND WATERWAYS

The efficiency of the transportation service, whether by rail or upon the ocean or upon inland waterways, depends on the equipment used and on the business organization by which the service is performed. Canal transportation in the United States is relatively unimportant; the equipment employed is crude, and the service is without organization. The traffic on our northern lakes, on the contrary, is of great volume, the vessels and the terminal facilities are of the highest technical efficiency, and the service is conducted chiefly by large corporations so organized as to secure the most economic business results. The equipment and management of the river transportation service are superior to those prevailing in the canal service, but do not compare with the equipment and business methods that characterize transportation on the Great Lakes.

The canal barge in general use, even on the Erie Canal, is the old type of wooden barge that has been in use for nearly a century. The maximum capacity of the Erie Canal barge is now what it has been for forty years (240 tons), and the canals of Pennsylvania, Maryland, Ohio, and Illinois are of smaller dimensions than the Erie Canal. Steam towage is employed to a slight extent on the Erie Canal, but nearly all of the tonnage moved on that and the other American canals is handled by animal traction.

The mule and the towpath have not yet given place to mechanical power.

The enlargement of the Erie Canal, now in progress, will permit the use of 1,000-ton barges, and will necessitate the use of mechanical traction. Probably a canal boat equipped with steam power, and loaded with its own quota of cargo, will tow two barges. By this method one engine will be able to move between 2,500 and 3,000 tons of cargo, or 85,000 to 100,000 bushels of wheat, from the Great Lakes to the seaboard. Barges of from 1,000 to 1,500 tons burden are used on the large rivers of Europe, and barges of half that size are commonly employed on many European canals.

The canal transportation service, as now performed, requires only a simple business organization. An individual or a small partnership may own and operate one barge, or several barges, without investing much capital or taking much business risk. The traffic on the Erie Canal, and others not under railroad control, is handled by numerous small carriers; while in the case of many of the canals that have been purchased by competing railroads, the waterways, when not closed to traffic and abandoned, are operated by a centralized organization such as a railroad company would naturally establish.

The present unorganized management of traffic will hardly suffice for conducting the large transportation service which the improved Erie Canal will be capable of performing. Upon it, and such other similar canals as may be opened in the future, some more highly organized and more economical management of traffic than now prevails upon our canals will be required.

Since the introduction of the steamboat on the Ohio and Mississippi rivers, during the second decade of the last century, the traffic of those and the other rivers of the United States has been conducted by the use of the

typical flat-bottom, stern-wheel steamboat, the design of which has not greatly changed for half a century. A large size Ohio or Mississippi river steamboat is from 200 to 250 feet in length, about 40 feet wide, and with a hold 8 or 10 feet in depth. The boats when loaded will ordinarily draw from 4 to 6 feet of water, the depth of draft depending upon the load, which in turn is determined by the available depth of the river channel. These flat-bottom river steamers will carry several hundred tons of cargo on a surprisingly small draft of water.

In times past, before the universal use of the railroad for travel, there was a large passenger traffic upon the rivers of the United States, particularly those of the Ohio and Mississippi section of the country; and even now, although most passengers travel by rail, river steamers are used by a relatively large number of travelers. It is stated, for instance, that over 2,500,000 passengers were carried to and from St. Louis by river during the World's Fair year of 1904. While the river traffic that year, as in the case of the rail traffic in and out of St. Louis, was unusually large, the steamboat lines nevertheless have a regular passenger traffic of fair proportions.

The freight traffic, on such rivers as the Mississippi, Ohio, and Hudson, is handled in part by regular lines of steamboats, and in part by independent packets and tow-boats. There are also numerous pleasure boats operated more or less regularly during certain seasons of navigation. The regular steamboat lines carry both freight and passengers. As illustrations of these river steamboat companies the following may be mentioned: The Cincinnati and Pittsburg Packet Line, which conducts a service three times a week between Pittsburg and Cincinnati; the Cincinnati, Pomeroy, and Charleston Packet Company, which has a weekly service between Cincinnati and Charleston; also a half-weekly service between Cincinnati and Pome-

roy, and a daily service to Maysville and to Chilo; the Diamond-Jo Line, which for many years has operated four steamers on the Mississippi, above St. Louis; the Lee Line, which has a regular line of four steamboats on the Mississippi, below St. Louis; and the Eagle Packet Company, whose fleet of six steamboats is operated on the Mississippi, both above and below St. Louis. Numerous other lines might be mentioned, but these are typical of the river steamboat packet service.

A large share of the traffic handled on the rivers of the United States, particularly on the Ohio and Mississippi rivers, consists of rafts and of barge traffic. For fifty years great quantities of lumber have annually been taken from the pine forests of northern Minnesota, Wisconsin, and Michigan, and much of that lumber has been delivered to lower Mississippi Valley points after having been rafted to and down the Mississippi River. The pine forests of the upper Mississippi Valley have been largely timbered over, and the amount of lumber rafted down the Mississippi and its affluents is far less now than formerly. The barge traffic down the rivers of the Mississippi Valley consists in part of grain and building materials, but most largely of coal, the chief part of which is taken from the mines adjacent to the Monongahela and Great Kanawha rivers. The manner in which this heavy coal traffic is shipped down the Ohio will be described in the following chapter.

The coal traffic down the Ohio is handled mainly by a few large miners and dealers in coal. One corporation, for instance, the Monongahela Consolidated Coal and Coke Company, owns upward of 100 towboats and 3,000 barges. These towboats and barges transport about 4,000,000 tons of coal annually. The traffic is economically handled, and when the project is completed of giving the Ohio River slack water with a channel of 6 to 9 feet in depth at low

THE STEAMBOAT *Sprague* RUN ON THE OHIO AND MISSISSIPPI RIVERS.
The boat is pushing barges containing 56,000 tons of coal.

stages, the tonnage of coal carried by barges down the Ohio and Mississippi rivers will doubtless much exceed its present large amount.

The establishment of slack-water navigation on the Ohio River will also hasten the movement that has begun for the substitution of steel barges in the place of the wooden ones now mostly used. Two types of wooden barges are now used for the shipment of coal from Pittsburg and West Virginia districts to New Orleans. About seventy per cent of the barges are constructed lightly and cheaply, and upon reaching New Orleans are sold for rough lumber. The other thirty per cent of the wooden barges are more strongly built, and when their cargoes are discharged at the mouth of the Mississippi they are towed back to the mines for reloading.

It is not probable that the present plan of constructing wooden barges or floats to make only one trip will be long continued, as the lumber is becoming too scarce to permit this to be done. In the future, reliance must be upon the more strongly built barge of wood or steel. Steel has already begun to displace wood in barge construction. The American Steel and Wire Company, the American Bridge Company, and other large concerns, are putting steel barges into service with satisfactory results. The steel barge is not only stronger and more durable, but will carry about twenty per cent more cargo than a wooden one will on the same draft of water.

The enormous tonnage handled on the Great Lakes is now transported mostly in steel steamers and large steel barges. Over four fifths of the enrolled vessel tonnage of 2,062,147 on the Great Lakes in 1905 consisted of steamers. A large part of the tonnage designated as sail consisted of schooner-rigged steel barges, which are invariably towed, and are rigged with sails only to steady them and to assist somewhat in towing.

The size of the lake vessel is an indication of the technical efficiency of the lake fleet. The average size of the steamers on the lakes in 1905 was 905 gross tons, which would indicate a relatively small average size; but the average tonnage of the 41 steamers constructed and enrolled in 1905 was 3,869, the average tonnage gross of

FAST PLANT IN OPERATION AT CONNEAUT, OHIO, FOR HANDLING ORE.

the 18 steel steamers, exceeding 1,000 tons gross, enrolled in 1905, being 5,641 tons each.

Steamers that are 600 feet in length over all, with 58-feet beam and a depth of 32 feet, are being constructed for delivery in 1906. These enormous vessels will have a carrying capacity of fully 12,000 tons of cargo, and will have a gross tonnage of nearly 7,000. Nine of the 18 large ships launched in 1905 had each an enrollment of over 6,000 gross tons. A vessel of this size can transport

from 250,000 to 300,000 tons of iron ore from the head of Lake Superior to the eastern end of Lake Erie during the season of navigation. Such vessels rank in size with the large ocean-freight steamers.

In transporting iron ore, loaded steamers sometimes are navigated singly, and sometimes each steamer takes two large barges in tow. A single set of engines may

Fast Plant for Handling Material at Port Morris, New York, for the New York Central Railroad Company.

transport over 20,000 tons of cargo. This is the most economical deep-water transportation in the world.

The transportation equipment on the Great Lakes includes not only the vessels for transferring the cargo from port to port, but also the terminal facilities for loading and unloading the cargo. The ore is loaded into the vessels by gravity through chutes from the ore docks located at the various shipping ports on Lake Superior. The ore

is shot through numerous hatches into the vessel, it being possible to load an enormous steamer in less than an hour from the time the vessel reaches the dock. When the ship reaches its terminal the ore is unloaded mechanically. Huge buckets carrying five tons or more of ore are filled automatically, and by means of electric cranes and cantalever carriers are emptied either into the cars standing alongside the vessel or upon ore dumps several hundred feet from the steamer. Vessels of the largest capacity may be unloaded in a single day at an expense of but a few cents per ton of cargo handled.

The traffic on the Great Lakes includes two general classes of service: the transportation of package freight or general cargo, and the movement of iron ore, coal, grain, oil, and other commodities shipped as bulk cargoes. The iron ore is transported mainly by the mine owners. The United States Steel Corporation alone had, in 1904, a fleet of 70 steamers and 42 barges. The Standard Oil Company uses its own steamers, having several tank vessels in service.

The package freight or general cargo is handled by line steamers, most of the vessel lines on the Great Lakes being owned by the trunk line and transcontinental railroads. The following list of the railroad steamship lines on the Great Lakes will show the extent to which the general cargo traffic is controlled by the railroad lines:

LAKE LINES CONTROLLED BY RAILROAD COMPANIES

| *Name of the vessel line.* | *Railroad owner.* |
|---|---|
| 1. Western Transit Company | New York Central & Hudson River Railroad. |
| 2. Rutland Transit Company | Owned through the Rutland Railroad by the New York Central. |
| 3. Canada Atlantic Transit Company | Grand Trunk Railway. |
| 4. Union Steamboat Company | Erie Railroad. |

| *Name of the vessel line.* | *Railroad owner.* |
|---|---|
| 5. Lehigh Valley Transportation Company. | Lehigh Valley Railroad. |
| 6. Mutual Transit Company............. | Jointly by the Erie, Lehigh Valley, Delaware, Lackawanna & Western; and the New York Central. |
| 7. Lackawanna Transportation Line...... | Delaware, Lackawanna & Western Railroad. |
| 8. Erie & Western Transportation Company (Anchor Line)............... | Pennsylvania Railroad. |
| 9. Baltimore & Ohio Lake Line.......... | Baltimore & Ohio Railroad. |
| 10. Great Northern Steamship Company... | Great Northern Railway. |

The largest lines on the Great Lakes are the Western Transit Company, owned by the New York Central Railroad, and the Erie and Western Transportation Company (Anchor Line), owned by the Pennsylvania Railroad Company. The Erie and Western Transportation Company is a typical railroad line. It was formerly owned by the Empire Fast Freight Line, which became the property of the Pennsylvania Railroad when that corporation took over the Empire Line. Under the present name, the Anchor Line, 14 vessels are operated between Lake Erie points (Buffalo, Cleveland, Erie, and Detroit) and Lake Michigan and Lake Superior points, the western termini being Duluth and Chicago. The traffic westbound comprises all kinds of general package freight, the cargo east bound consisting mainly of flour and grain products, with a small amount of copper. Four of the 14 vessels carry passengers, and have regular sailings between Buffalo and Duluth.

The organization of the lake transportation service comprises:

(1) The operation of ships by individual owners or by small companies. Formerly most of the lake business was handled in small vessels owned by persons and companies engaged solely as carriers on the lakes. During


THE *Delaware.*

A typical package-freight lake steamer of 5,000 tons gross register.

recent years, however, the individuals and small companies have become an unimportant factor in lake transportation.

(2) Lines of vessels owned and operated by railroad companies. The railroads connecting the Atlantic seaboard with the Great Lakes have established lines of vessels on the lakes both to enable them to ship from Eastern points by rail and water route to the middle West, and to enable them to secure for their railroad lines in the East as large a share as possible of the traffic originating about and beyond Lakes Superior and Michigan. The transcontinental railroads having lake lines have established such lines in order to secure a greater volume of the through passenger and freight traffic between the Eastern and Western sections of the United States.

(3) Lines of vessels controlled by large mining and manufacturing corporations. The United States Steel Corporation, and other big manufacturing concerns, have found it economical to control all the processes of production, from the extraction of the raw material from the ground to the completion of the finished manufactured product. The Standard Oil Company carries this process so far as to deliver manufactured oil to consumers in all parts of the world.

The tendency toward consolidation of ownership and management has been very marked in the organization of the lake transportation service. The former competition of lake carriers with rail carriers has given way to the competition among carriers owning both rail and lake transportation facilities. Possibly the most marked form of competition on the Great Lakes at the present time is that between the carriers not engaged in production and the mining and manufacturing corporations that provide themselves with their own lake shipping facilities. Any attempt on the part of the carriers to charge unreason-

able rates on the Great Lakes is bound to result in the producers themselves becoming carriers.

Competition on the Great Lakes is regulated by two organizations: the Lake Carriers' Association, whose office is located in Detroit, and the Association of Lake Lines, with headquarters at Buffalo. All the important carriers on the Great Lakes are members of the Lake Carriers' Association. In 1905 this organization had 542 members, owning a gross tonnage aggregating nearly 1,500,000. The association concerns itself with all matters of interest to lake carriers, particularly with the improvement of harbors, channels, and other traffic conditions on the Great Lakes. The Association of Lake Lines includes in its membership the principal package freight lines engaged in regular service. The organization has to do mainly with the regulation of rates and other traffic questions. All the railroad companies having lake lines are members of the Association of Lake Lines, as also are numerous other corporations operating lines of vessels on the lakes. Without the regulation of intercompetition among lake carriers their rivalry would lead to ruinous rate cutting. The reasons necessitating coöperation among rival railroads require the same kind of coöperation among competing lake carriers.

In the development of transportation on the Great Lakes the people of the United States have been more successful than they have been in building up an ocean merchant marine. The transportation requirements to be met on the Great Lakes have called for the use of vessels of great size and efficiency, and have naturally led to the concentration of the management of the business into the hands of a relatively small number of carriers and shippers. Foreigners not being permitted to operate under the American flag, the lake traffic, as well as our coastwise commerce, has been reserved entirely to the people of the

United States; this elimination of foreign competition has, however, in no way hindered the technical development of lake shipping. The American people have met the requirements of the lake service as fully as they have solved the enormously difficult problems of railroad transportation in the United States.

## REFERENCE FOR FURTHER READING

The best information regarding the organization of the service and the equipment employed upon the inland waterways of the United States may be found by consulting the current issues of such papers as the *Marine Review*, Cleveland, Ohio, and the *Nautical Gazette*, New York City.

## CHAPTER XXVII

### TRAFFIC ON THE INLAND WATERWAYS OF THE UNITED STATES

THE total volume of traffic transported on the inland waterways of the United States at the present time cannot be stated, because the statistics are regularly kept for only a part of the routes employed by our domestic commerce. An effort was made by the census of 1890 to ascertain the tonnage moved on our inland waterways at that time; and the United States Bureau of the Census is now, in 1906, again preparing to compile similar statistics, which will not be ready for publication until 1907. A few years ago the Bureau of Statistics, formerly in the Treasury Department and now connected with the Department of Commerce and Labor, began to publish such statistics regarding the internal commerce of the United States as the bureau could obtain from boards of trade and other voluntary sources, official and unofficial.

Until provision is made by act of Congress for systematically collecting and reporting the statistics of inland transportation, as the statistics of railway transportation are now compiled, it will be impossible to measure completely and accurately the traffic moved on the inland waterways of our country. Fortunately, the tonnage of the main inland water routes is known with approximate accuracy, and the figures for those waterways will indicate the extent to which the internal commerce of the United States is transported by water.

The most important canal in the United States is the Erie Canal, the tonnage of which, however, has tended to decline during recent years. The Erie and the other canals of New York State have averaged about 3,500,000 tons of freight annually during the past five years. This small volume of traffic is to be explained by the fact that the Erie Canal for many years has needed enlargement and improvement to meet the conditions of present-day transportation. Barges with animal traction capable of handling a maximum cargo of only 240 tons can hardly be expected to compete successfully with railroads over which trainloads of 1,500 tons or more can be hauled. The present work of enlarging the canals of New York State so that they will accommodate steam-propelled barges carrying 1,000 tons of cargo will unquestionably greatly increase the volume of traffic moved on those waterways.

The traffic on the Ohio canals is small, and can hardly be expected to increase until the canals have been modernized and enlarged. The future industrial development of the State of Ohio, the enlargement of the Ohio canal, and the carrying out of the plan that will provide slackwater navigation in the Ohio River from Pittsburg to Cairo, will in time create conditions that will increase the tonnage of traffic that can advantageously make use of the canals situated as are those between Cleveland and the Ohio River. It is also probable that the future development of the Miami Valley may give commercial importance to a canal in the southwestern part of the State; it is hardly probable, however, that a large volume of traffic will ever move by water between Cincinnati and the head of Lake Erie.

The commerce carried on the Illinois and Michigan Canal, connecting Chicago with the navigable portion of the Illinois River, has declined with the cheapening of

transportation by rail. The traffic on this canal in 1882 exceeded 1,000,000 tons; the traffic in 1904, however, amounted to only 47,616 tons. The United States Government is gradually improving the Illinois River, and will soon complete the Hennepin Canal, connecting Rock Island on the Mississippi River with the great bend of the Illinois River near Hennepin. The completion of the Hennepin Canal will give a continuous canal route from the Mississippi River at Rock Island to Chicago, and this, together with the improved navigation of the Illinois River, should add to the traffic handled on the Illinois and Michigan Canal. For some years an agitation has been carried on for the enlargement of the Illinois and Michigan Canal, and for the establishment of slack-water navigation on the Illinois River, so as to provide a channel that will accommodate much larger vessels than can now use the Illinois and Michigan Canal. This agitation was started by the construction of the Chicago Drainage Canal, which carries a large volume of water from Lake Michigan to the Des Plaines River, and thus to the Illinois River.

The above facts regarding the traffic of the canals of Illinois, Ohio, and New York are sufficient to show that the small canals built many years ago by the States have ceased to be of much commercial importance. Canals having no larger dimensions than these waterways now possess must expect to have a declining traffic; this, however, does not prove that canals of greater depth and width, connecting our chief natural inland waterways or serving sections of country having highly developed industries, may not be useful in the future.

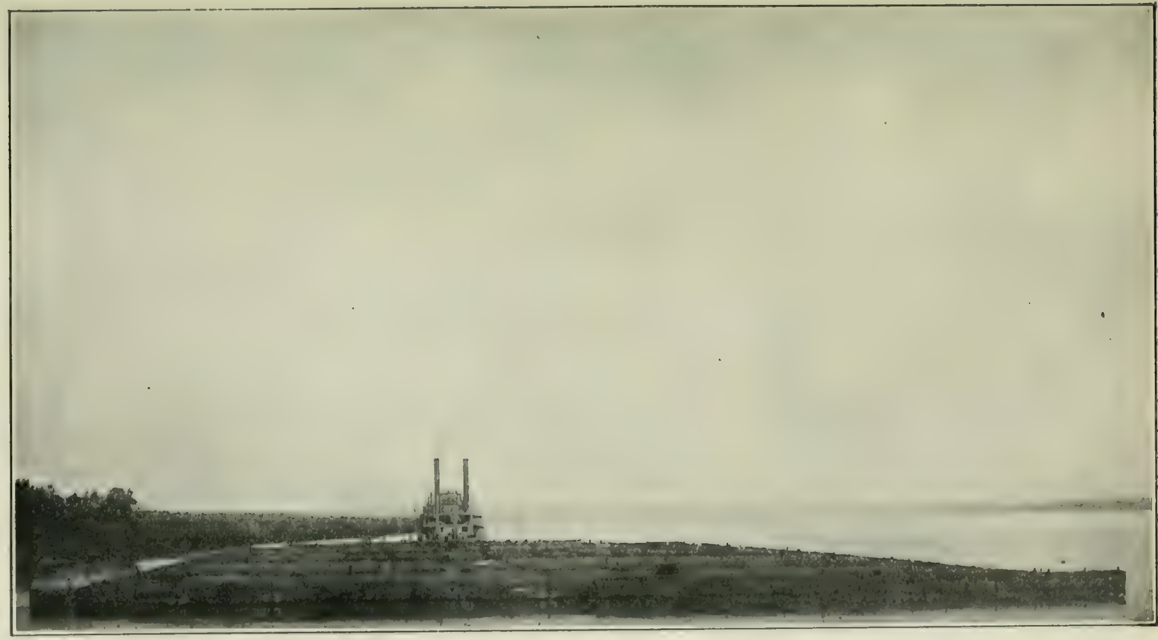
The traffic on the Hudson River between New York City and Albany and Troy, in 1890, comprised 15,000,000 tons of freight, in addition to the 3,500,000 tons that passed from the State canals of New York to tidewater

via the river. The present tonnage probably exceeds that of 1890, but the exact amount cannot be stated.

According to the census of 1890, the boats and barges afloat on the Mississippi River and its various tributaries numbered 7,445 craft, with a total enrolled tonnage of 3,400,000. The freight carried by these vessels that year was reported to be 30,000,000 tons, and the number of passengers carried was 11,000,000. The figures for freight tonnage may contain some duplications; and the traffic at the present time is undoubtedly less than it was in 1890, but the exact amount will not be known until the completion of the census of 1906. According to the United States Bureau of Statistics, 5,577 vessels arrived and cleared at Cairo during the year 1904. The tonnage of these vessel entrances and clearances exceeded 3,500,000. The figures for 1905 were 4,254,428, being much larger than for 1904. The nature of this traffic is indicated by the fact that of the 7,268 vessels that entered and cleared at Cairo in 1905, 1,675 were loaded with coal, 719 with lumber and wood, and 742 with general merchandise. Other vessels carried rock, iron and steel, brick, grain, and various kinds of cargo.

The traffic upon the Ohio River consists most largely of coal carried down in barges, from points located mainly along the Monongahela and Kanawha rivers. Nearly 4,000,000 tons of coal annually pass Davis Island Dam, a little distance below the city of Pittsburg. The traffic down the Kanawha River amounts to about 1,500,000 tons, most of which is coal. The manner in which the coal traffic is handled down the Ohio River is stated as follows by the Vice-President of the Chamber of Commerce, Pittsburg:

Three species of boats loaded on the Monongahela River for the Ohio River trade are used by the shippers, viz., coal boats, drawing 8 to 8½ feet, and carrying 1,000 to 1,100 tons; coal barges, draw-



The Ohio River Steamboat *Joseph B. Williams* Pushing a Tow of 58,120 Tons of Coal down the Mississippi River.

ing 6 to 7 feet, carrying 500 tons; and coal floats, carrying from 200 to 300 tons.

The towboats usually bring from the mines about 3,000 tons of coal in small fleets, arranged for passing the locks conveniently. . . . At Pittsburg . . . the small coal fleets are moored while awaiting rises sufficient for navigation on the Ohio River. . . . When rises of 10 feet occur, or sufficient for 8-feet coal barges, fleets from 10,000 to 15,000 tons are made up for shipment to Cincinnati or Louisville.

At Louisville, two and sometimes three of the Pittsburg fleets are made up into monster fleets of from 35,000 to 40,000 tons, and towed to New Orleans by powerful towboats. A fleet conveying 40,000 tons covers about ten acres.

According to the report of the Merchants Exchange of St. Louis there are 7 lines of river steamers plying between St. Louis and other ports on the Mississippi River and tributaries to the Mississippi; there are also independent packets and towboats, some of which are operated on the lower Mississippi and some on the upper Mississippi. The figures for this St. Louis traffic have averaged about 500,000 tons during recent years.

The great section of country drained by the Mississippi River and its many navigable affluents is still too sparsely settled in most localities to afford a large tonnage for shipment by water. When the region comes to have a dense population, and to have a greater amount of manufactures requiring the shipment of large quantities of materials, there will be greater use made of the waterways. The opening of the Panama Canal will enhance the importance of the Mississippi system of waterways, and of the other rivers flowing into the Gulf of Mexico. The traffic on the Mississippi and other river systems, moreover, can hardly increase to much extent before the more important improvements and extensions now being made are carried out. Only by connecting the river system of Alabama with the coal and iron region of

that State, by uniting the Mississippi River with the Great Lakes by an efficient waterway, and by completing the improvements of the Ohio, the Illinois, Columbia, and other rivers, will we establish conditions favorable for the growth of the traffic of our inland waterways.

The commerce handled on the Great Lakes is of large and rapidly growing volume. The conditions for the development of a heavy traffic could hardly be more favorable than they are in connection with this unrivaled inland waterway. Vessels drawing twenty feet, and carrying 10,000 or 12,000 tons of cargo, have an uninterrupted watercourse a thousand miles in length, connecting the iron and copper mines, the forests, and the grain fields about and west of Lake Superior with the coal fields and highly developed manufacturing sections south and east of Lake Erie, uniting Chicago, Milwaukee, and other great trade centers of the central West with the industrial East, and affording water transportation facilities of the highest efficiency to all the many thriving cities located on the shores of the lakes.

The vessels employed in the transportation of the commerce of the Great Lakes have a total enrolled tonnage of over 2,000,000 tons, and most of this tonnage consists of modern steel steamers of exceptional traffic efficiency. The rate at which the traffic of the Great Lakes has grown since 1870 is indicated by the figures in the table on page 366 for the vessel tonnage at the beginning of each five-year period since that date.

About one third of the total tonnage of shipping under the American flag is in our Great Lakes fleet, and it is this third of our tonnage that is showing the most rapid gains.

The cargo tonnage of the Great Lakes traffic shipped during the calendar year 1905, from the 187 ports from which the United States Bureau of Statistics received

SAIL AND STEAM TONNAGE OF THE GREAT LAKE FLEET BY FIVE-YEAR PERIODS, FROM 1870 TO 1905.

| YEAR. | Sail. | Steam. | Canal Boats. | Barges. | Total. | Increase. |
|---|---|---|---|---|---|---|
| 1870.... | 264,609 | 142,973 | 249,553 | 27,569 | 684,704 | ....... |
| 1875.... | 339,787 | 202,307 | 250,657 | 45,140 | 837,891 | 153,187 |
| 1880.... | 304,933 | 212,045 | 47,159 | 40,965 | 605,102 | −232,789 |
| 1885.... | 313,129 | 335,859 | 70,150 | 30,810 | 749,948 | 144,846 |
| 1890.... | 328,656 | 652,923 | 67,574 | 13,910 | 1,063,063 | 313,115 |
| 1895.... | 300,642 | 857,735 | 44,074 | 39,008 | 1,241,459 | 178,396 |
| 1900.... | 335,183 | 1,110,565 | 41,430 | 78,409 | 1,565,587 | 324.128 |
| 1905.... | 301,115 | 1,647,793 | 43,775 | 69,464 | 2,062,147 | 496,560 |

reports, amounted to 67,345,620 net tons. Five years earlier the shipments amounted to 45,138,420 tons.

The best single index of the traffic on the Great Lakes is to be found in the vessel and cargo tonnage passing the Sault Ste. Marie locks between Lakes Superior and Huron. During the calendar year 1905, 36,778,738 tons of freight passed from Lake Superior to Lake Huron, and 7,491,942 tons were carried in the opposite direction—the total cargo tonnage passing the locks being 44,270,680 tons. The value of this freight was about $450,000,000. The importance of the Great Lakes to the industrial progress of the United States is partially indicated by the fact that the traffic that passed the "Soo" was carried an average distance of 850 miles. The transportation cost per ton mile in 1904 was only .8 of a mill (.081 of a cent).

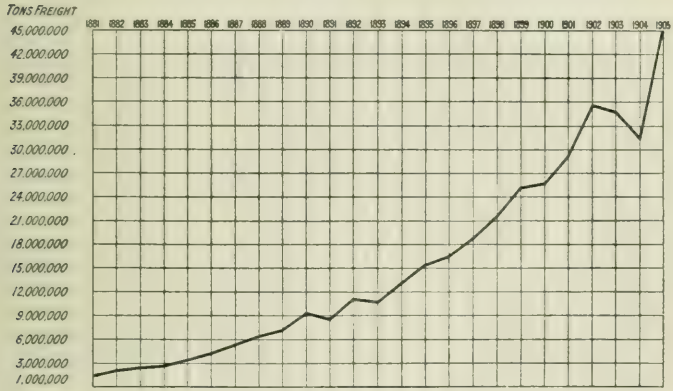
The volume of traffic passing the Sault Ste. Marie locks annually from 1881 to 1905, and the increase each year, is graphically shown by the chart on page 367.

The chief characteristics of the commerce moved on the Great Lakes are the preponderance of eastbound over westbound tonnage, and the fact that a few commodities make up most of the freight. The following analysis of

the traffic at the Sault Ste. Marie and on the lakes as a whole will indicate the main features of the service:

(1) The eastbound tonnage in 1905 was nearly five times that moving westward. This results mainly from the great tonnage of iron ore transported from Lake Superior to the soft-coal fields. The raw materials carried eastward exceed in weight the manufactures and the coal which comprise most of the westbound tonnage.

(2) The commerce of the Great Lakes is composed mainly of a few commodities: Iron ore in 1905 comprised




six sevenths of the total tonnage moved eastward through the Sault Ste. Marie locks, and one half of the aggregate tonnage of shipments from all the lake ports. Coal made up six sevenths of the westbound tonnage at the Sault Ste. Marie, and nearly one fifth of the total lake traffic. Wheat, other kinds of grain, and flour constitute a large tonnage amounting to one tenth of the freight eastward at the Sault Ste. Marie, and about one twelfth of the total lake traffic. Lumber is another large item, amounting to about one twentieth of the westbound Sault Ste. Marie traffic and of the aggregate lake tonnage. Iron ore, grain

and flour, and lumber include about ninety-nine per cent of the tonnage outbound from Lake Superior. These three classes of traffic, and coal, now comprise over ninety per cent of the Great Lakes tonnage, while "unclassified" or miscellaneous package freight accounts for only eight or nine per cent of the total.

Seven eighths of the total package freight is shipped westbound from the manufacturing East to the agricultural and mining West and Northwest. The westbound traffic on the lakes consists chiefly, in addition to coal, of general merchandise of all kinds, iron manufactures, and salt.

(3) By far the larger part of the freight transported on the Great Lakes is long-distance through traffic—iron and copper ore, grain, flour, and lumber, from Lake Superior to Lake Erie; grain and lumber, from Lake Michigan to Lake Erie, and coal from eastern Lake Erie to the head of Lakes Michigan and Superior. These facts explain why the average distance a ton of freight is moved on the lakes is three times the average distance freight is hauled by rail in the United States. Even the package freight or general merchandise handled on the lakes is long-distance traffic carried beyond the lake on which the shipment originates. There are only three steamship lines, each operating but a few small vessels, engaged solely in Lake Erie traffic. All the large lines of steamers navigate two or more lakes.

(4) Although there are nearly 200 ports on the Great Lakes, most of the traffic is handled at a relatively small number of places. This is shown by the distribution of the four leading articles of traffic: iron ore, grain, lumber, and coal.

Iron ore, which comprised almost half of the entire tonnage in 1905, is nearly all shipped from six Lake Superior ports—Two Harbors, Superior, Duluth, Ashland,

Escanaba, and Marquette—and about half of the ore is loaded at Duluth and Two Harbors. Most of the ore from these six Superior ports is carried to nine cities on Lake Erie—Ashtabula, Cleveland, Conneaut, Lorain, Buffalo, North Tonawanda, Erie, Fairport, and Toledo—over half the tonnage being discharged at Ashtabula, Cleveland, and Conneaut. The only important destination of iron ore, outside of Lake Erie, is Chicago, which receives about ten per cent of the ore shipped on the lakes.

Wheat is shipped eastward chiefly from Duluth, Superior, Chicago, Milwaukee, and Toledo. Flour is dispatched principally from Chicago, Milwaukee, Superior, Duluth, and Gladstone (Michigan). The destination of most of the wheat and flour is Buffalo, although Erie and Ogdensburg are ports of some importance.

The lumber traffic originates and terminates at a larger number of ports than is true of the iron ore and grain shipments. One fifth of the lumber tonnage, however, starts from Duluth, other important shipping points being Manistique, Manitowoc, and Ashland. The largest recipient of lumber, naturally, is Chicago, after which come North Tonawanda, Cleveland, Ludington, and Buffalo.

Anthracite coal is shipped mostly from one port, Buffalo, the only other one from which much is sent being Erie. The hard coal is distributed quite generally among the cities about Lakes Michigan and Superior, but Chicago, Milwaukee, and Superior receive much larger quantities than other places do. The bituminous coal is shipped from numerous Lake Erie ports, but Ashtabula, Toledo, Cleveland, Lorain, and Sandusky are by far the most important shipping points. Although several ports on Lakes Michigan and Superior receive soft coal via the lakes, Milwaukee, Superior, and Duluth take over half

of the total amount. The large quantity of soft coal required in Chicago is supplied by the railroads.

(5) Another characteristic of the traffic on the Great Lakes is that most of the vast tonnage is now handled by a relatively small number of highly efficient carriers. The business is organized upon the economical basis of large-scale transportation. The organization of the service and the extent to which lake transportation is controlled by the railroads and by the large producers and shippers who supply the lake traffic were considered in the preceding chapter.

Instructive comparison may be made between the traffic on the railroads and inland waterways of the United States. The commerce of the Great Lakes compares favorably with railroad freight in rate of growth and volume. The total tonnage transported by our railroads in 1904 was 641,680,547, and the ton mileage, or number of tons moved one mile, was 174,522,089,577. The tonnage of the traffic shipped on the Great Lakes (tonnage of shipments only) for the last three years averaged about 60,000,000 tons. (In 1905 it amounted to 67,345,620 tons.) The ton mileage of the lake traffic as a whole is not known, but it is not far from 50,000,000,000, the traffic on the lakes being about thirty per cent of the ton mileage of the traffic by rail. The ton mileage of the freight handled in 1904 over the Vanderbilt lines in New York State, and the Michigan Central, the Lake Shore, and the Nickel Plate between Buffalo and Chicago, aggregated 15,205,135,411. In 1890 these rail lines had a traffic amounting to 7,338,472,141 ton miles. Their total linear mileage was 4,960 in 1890, and 6,743 in 1904. The entire tonnage of shipments on the lakes in 1890, according to the United States census of that year, was 25,266,974, and the ton mileage probably was about 20,000,000,000.

The traffic on the Mississippi River, and on some of its tributaries, with the exception of the Ohio, is either stationary or declining. The same is true of the tonnage of most of the rivers and canals of the United States. The traffic carried by the railroads is rapidly increasing, and will unquestionably grow steadily larger with the progress of the United States in population and in industry. The commerce making use of our rivers and canals can hardly be expected to show much gain in the immediate future.

At least two conditions must be fulfilled before the rivers and canals of the United States will show much improvement in the volume of their traffic. Our main streams, such as the Ohio, Mississippi, and the Columbia, and our less important rivers, such as the main tributaries of the Ohio and those which reach the Gulf via Mobile Bay, must have the improvements now in progress completed before shippers will find it profitable to use the waterways instead of the railroads for transporting the bulky commodities, such as coal, lumber, grain, cotton, etc., adapted to water transportation.

The other condition that must precede a larger use of our natural inland waterways in most sections of the country is a greater density of population and a more highly developed state of industry. In most sections of the country, at the present time, the demands for transportation are adequately met by the railroads; in course of time, however, many sections of the country will find both waterways and railroads necessary for supplying adequately and economically the transportation services required to meet business conditions.

Inland water transportation in the United States is undeveloped except upon our Great Lakes. The conditions in our country in this regard are unlike those in Germany, Belgium, Holland, and France, where the con-

struction and enlargement of the waterways has received almost as much attention as has been given to providing those countries with adequate railway facilities. The Rhine, Elbe, Seine, and Danube, and other important streams of Europe, are used for the transportation of great volumes of traffic. Moreover, the countries just named have systematically connected the important rivers with canals, for the purpose of providing the country, as far as practicable, with a network of waterways comparable with the network of railways.

Some critics are of the opinion that the countries of continental Europe have overemphasized water transportation, and that it would have been better had more attention been given to the development of their railways, and less to the improvement and extension of their system of waterways. Whether this criticism is valid or not need not be discussed in this connection; attention is here called only to the fact that numerous countries outside of the United States have thought best to improve their inland waterways, and the improvement of those waterways has resulted in their use for a large volume of traffic; and attention may also be called to the fact that France, Germany, Belgium, and Holland have all prospered industrially and otherwise while they have been following this plan of developing facilities for both rail and water transportation.

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# CHAPTER XXVIII

## THE RELATIONS OF INLAND WATERWAYS AND RAILROADS AS CARRIERS

The transportation services performed by the inland waterways differ in many particulars from the services rendered by railroads. Waterways are especially adapted to the transportation of such articles as grain, lumber, minerals, sand, brick, and other commodities that may be shipped in large quantities and at a slow rate of speed. The railroad is adapted to the transportation of all varieties of articles, and in the case of high-priced commodities requiring rapid transportation the railroad is the only carrier capable of performing the service.

The relations of inland waterways as carriers were well summarized in the following resolution adopted some years since by the Fourth International Congress on Inland Navigation: "The existence and development together of railways and waterways is desirable, first, because these two means of transport are the complements of each other, and ought to contribute each according to its special merits to the public good; second, because, viewed broadly, the industrial and commercial development which will result from the improvement of the means of communication must in the end profit both railways and waterways."

Waterways are both competitors and complements of the railroads. The two means of transportation serve commerce in different ways. When shippers are able to

choose between the two methods of transportation, the waterways compete with the railroads for the carriage of several kinds of traffic, and the competition of efficient waterways compels the railroads to make their rates with reference to water competition; but the ultimate effect of water competition is to increase the traffic and the revenues of the competing railroad lines. This fact may be explained by a brief analysis of the relations of the two agencies of transportation.

As competitors of the railroads, waterways place a limit on the maximum charges which the rail carrier may impose. The most conspicuous illustration of this fact is the effect of the rates on the Great Lakes upon the charges of the railroads that compete for the traffic free to move either by the lakes or by rail. In times past the Erie Canal has placed a very definite maximum limit upon railroad charges between the lakes and tidewater. At the present time, however, it is possible to carry traffic by rail about as cheaply as it can be moved by the unimproved Erie Canal. The enlargement of that waterway now in progress will undoubtedly restore to it the influence it has formerly had upon railroad charges.

The influence of water transportation on rail rates is especially conspicuous in the case of the Danube, Rhine, Elbe, and other rivers of Europe upon which there is a large volume of traffic.

A study of the annual report of the Chief of Engineers of the United States Army will show that a large number of navigable rivers of the United States, even in their present undeveloped condition, exercise more or less influence locally upon the charges imposed by the railroads. This influence of water transportation upon rail transportation affects only a part of the traffic handled by rail, and its influence in the case of most waterways is local. The competition of waterways is not a complete and ade-

quate regulator of charges of railroads, but it is of such advantage to the public that most countries are spending large sums of money to increase and widen the scope of water competition.

The public estimation put upon the efficacy and value of competition of waterways with railroads was stated twenty years ago, in the report prepared by a Senate committee, of which Hon. Shelby M. Cullom was chairman, to accompany the bill which in 1887 became the present Interstate Commerce Act. The report stated that

"The evidence before the committee accords with the experience of all nations in recognizing the water routes as the most efficient cheapeners and regulators of railway charges. Their influence is not confined within the limits of the territory immediately accessible to water communication, but extends further, and controls railroad rates at such remote interior points as have competing lines reaching means of transport by water. Competition between railroads sooner or later leads to combination or consolidation, but neither can prevail to secure unreasonable rates in the face of direct competition with free natural or artificial water routes. The conclusion of the committee is, therefore, that natural or artificial channels of communication by water, when favorably located, adequately improved, and properly maintained, afford the cheapest method of long-distance transportation now known, and that they must continue to exercise in the future, as they have invariably exercised in the past, an absolutely controlling and beneficially regulating influence upon the charges made upon any and all means of transit."

In order to be an effective competitor of the railroads the waterway must, however, meet the conditions of present-day commerce. No transportation agency can be of value to the public unless it is prepared to perform the transportation services shippers desire to secure. The

Great Lakes in the United States and the main waterways of Europe fulfill the transportation conditions demanded by present business methods. The same is true of a few of the rivers of the United States, though in the case of many of our rivers and most of the American canals this is not true. These antiquated waterways have ceased to be effective competitors of our railroads whose technical development is of the highest order.

Waterways are complements of the railroads. In the long run water competition is not ruinous, but helpful, to the railroads. The truth of this somewhat paradoxical statement is due to the fact that the two means of transportation are different agents of commerce. The waterway, such as the Great Lakes or the Rhine River, by providing facilities for the cheap transportation of a large tonnage of bulky commodities, so promotes industrial development and so increases the density of population as ultimately to give the railroads a larger and more profitable traffic than they would secure if the waterway were not in existence.

Canals, rivers, and lakes create a large share of their traffic. The cost of transportation determines to a great extent the amount of goods shipped. Cheaper rates give to existing categories of freight a larger and wider market and introduce into commerce new articles, such, for instance, as sand, stone, straw, fertilizers, and wood, which were formerly unable to bear the costs of transportation. Again, the waterway creates traffic for the railroads as well as for itself. It makes raw materials cheaper, increases the number of those that are available for use, and thus adds to the products of agriculture and manufactures seeking transportation. The effects of increasing and cheapening raw materials are complex; cheaper wholesale and retail prices and higher wages are possible, and these in turn prepare the way for a larger and more varied

consumption of goods. This means important additions to the shipments, especially of manufactured goods, the kind of freight which from its nature falls mainly to the railroads.

Being complements as well as competitors of the railroads, it is desirable both for the public and for the railroads that the two means of transportation should be coördinated. While there is no sharp division of freight between waterways and railroads—one kind of traffic not being carried invariably by water and other kinds by rail—the coördination of the two means of transportation enables each carrier to handle the traffic for which it is best adapted. This coördination of rail and water routes has been well worked out on the Great Lakes with most economical results. The policy of Germany, France, and certain other European countries also is to coördinate rail and water routes for the purpose of enabling each means of transportation to perform to the best advantage the service for which it is adapted.

The coördination of rail and water transportation has a favorable rather than a detrimental effect upon railroad revenues. If the waterway carries a large traffic the freight and passenger business of the railroads becomes more profitable. In a thickly settled country, whose industries and trade require the transportation of large quantities of raw materials and manufactures, and where the traffic is so heavy as to provide a large tonnage for movement both for the railways and the waterways, the division of the traffic between the two carriers has the effect of making the traffic of the railroads relatively more profitable. Manufactures and other commodities of high value, upon which the rail rates are greater than they are upon materials of industry, constitute a larger percentage of the total traffic of the railroads than they would constitute if the waterway were not in existence. The effect of

this upon the railroads is to lower the ratio of operating expenses to gross receipts; or, stated otherwise, to increase the net profits resulting from the transportation of freight.

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## CHAPTER XXIX

### THE FUTURE OF INLAND WATER TRANSPORTATION IN THE UNITED STATES

The people of the United States possess an extensive system of natural waterways, and the question of their possible usefulness in promoting the industrial and commercial progress of the country presents a problem of great moment. The question as to whether our waterways shall be improved or not has already been answered in the affirmative. The United States is now engaged in the improvement and maintenance of a large number of inland waterways. The State of New York is spending over $100,000,000 in reconstructing the Erie and Champlain canals; the State of Ohio is spending a moderate sum in improving its waterways; and the agitation in favor of public aid to water transportation is being carried on in several other States. Is the policy that is being pursued by the United States, and some of the States, a wise one? Will the future transportation services of our inland waterways justify carrying out this policy?

As far as the Great Lakes are concerned there can be no question as to the wisdom of what has been done to improve their navigation; nor is there any doubt concerning the advisability of continuing the deepening and enlargement of the principal harbors of the Great Lakes, and of giving such depth and width to the channels connecting the lakes as may be required to meet the demands of the commerce and shipping of the Great Lakes. The

enormous and rapidly increasing traffic on the lakes, and the influence of the cheap transportation provided by them upon the industries and domestic and foreign trade of the United States, justifies the United States Government in making such expenditures as may be required from time to time to keep the harbors and channels of the Great Lakes abreast of commercial requirements.

In the case of certain rivers the policy that ought to be pursued is quite as clear as in the case of the Great Lakes. The traffic on the Ohio River and the relation of that stream to the economic interests of the great industrial section drained by that river fully warrant the earliest practicable completion of the project now in progress of execution, by which that stream is to have slackwater navigation, with a channel nine feet in depth during low stages of water. The improvement of the Mississippi River presents an engineering problem of great difficulty. If, as is probable, the engineering obstacles can be overcome, the people of the United States will decide in favor of so improving the Mississippi River as to make it an efficient water route available for traffic throughout the year, except during the season of the year when the ice may require the suspension of traffic. The use made of the Mississippi River at the present time is not an adequate measure of the future usefulness of that stream. The rapid development of the great Mississippi Valley, the increasing volume of our foreign trade, and the completion of the Panama Canal, will so enlarge the transportation requirements of the Mississippi Valley as to give the Mississippi River a far greater opportunity than it now has to be of service to the central section of our country.

The improvement of such rivers as the Hudson, the Columbia, the Illinois, and those of the State of Alabama, will undoubtedly be justified by the future growth of the

population and industries of the territories tributary to those rivers. The Hudson River is one section of the water course between the Great Lakes and the sea. The Illinois River forms the natural water route between the Great Lakes and the Mississippi. The rivers of Alabama make possible the establishment of water routes connecting the rich coal and iron deposits of Alabama with tidewater at Mobile. The Columbia River and its tributaries make possible cheap water transportation for the northwestern section of the United States, a region of great size, comprising natural resources of enormous value. There can hardly be any doubt as to the wisdom of improving these and our other more important waterways, for the purpose of keeping the transportation facilities of our country abreast with our social and industrial requirements.

In discussing the place which canals may be expected to occupy in the American transportation system in the future it is well to bear in mind that there are three distinct kinds of canals. There are those with capacity and equipment for floating the ships that ply the ocean and such large interior lakes as make up the chain along our northern boundary; then, there are canals whose construction, breadth of way, and locks make them navigable by the large steamers of shallow draft that run on the main rivers; finally, there is the barge canal, the waterway which the word "canal" first calls up in the minds of most persons. This third kind requires a depth equal to or greater than is necessary for river boats, but its other dimensions may be smaller. The traction of canal barges has been, and is even to-day, generally horse power; that, however, was not a necessary condition of barge canal traffic; in the future, steam, or perhaps electricity, will, in the case of the waterways as elsewhere, be the prevailing motive power. It is obvious that these three kinds

of canals fulfill different services to commerce, and do not each stand in the same relation to other means of transportation.

The small barge canal of former days is no longer of commercial value; the railroad has already become a much more efficient freight carrier than such canals are. It is accordingly certain that the small barge canals, such as the Erie Canal now is, will not be constructed in the future. The artificial waterways of the future, in order to be useful, must be built either so as to accommodate the vessels navigating the natural waterways connected by the canals, or so as to permit the use of steam or electrically driven barges with carrying capacity of from 500 to 1,500 tons.

In 1893, Mr. Ewald Bellingrath, a transportation authority of high standing, speaking with reference to the relation of canals to railroads in Germany, and of the kind of canal that would be able to compete successfully with the railroads and be of real service to commerce, said: "The power of the canal to compete with the railroad in regions where the difficulties are not too great is beyond doubt, if (1) a sufficient quantity of freight exists or can be secured for transportation; (2) the canal be constructed with not too small proportions, for boats or barges not under 500 tons; (3) there be a good service to supply steam traction." Since 1893 commercial conditions have so changed as to make desirable larger dimensions than Mr. Bellingrath names in the foregoing statement of conditions requisite to successful canal transportation. Canals connecting improved waterways should in the future, in most cases, be constructed with a depth of at least 12 feet, so as to accommodate barges of 1,000 or more tons burden.

There are relatively few locations in the United States where canals of the foregoing dimensions can be constructed. Waterways connecting the Great Lakes with the

ocean, with the Ohio River at Pittsburg, and with the Mississippi River should be constructed with reference to carrying barges of at least 1,000 tons burden. Probably the waterways connecting the Alabama coal and iron fields and the manufactures of the Birmingham district with Mobile should also be made so as to accommodate 1,000-ton barges.

The United States will doubtless construct a few canals to shorten the main ocean routes followed by our large and growing coastwise commerce. Unquestionably the short canal connecting the Chesapeake and Delaware bays ought to be much enlarged, so as to accommodate ocean shipping; and there is little doubt as to the desirability of a canal to save passing around Cape Cod peninsula. There has been much said in favor of an ocean ship canal across New Jersey, from deep water on the Delaware to the ocean near New York City, and another across the northern part of the peninsula of Florida. It is questionable, however, whether either one of these waterways would be used extensively by ocean vessels in preference to the somewhat longer open-sea route. Both of these canals would be of value to our navy, and for naval reasons their construction might possibly be justifiable, although they are not an unquestionable necessity to commerce.

The services that inland waterways are to perform in the future will differ from those they have rendered in the past. Both the railroads and the waterways of the future are destined to be more efficient transportation agents than they have been in the past. Although the railroad has reached a high state of efficiency and has by no means reached the end of its technical development, the usefulness of inland waterways as a part of the general transportation system of the country will not cease to be important. Indeed, the value of inland waterways

will tend to increase with the advance of our country in population and in industry. The development of facilities for public carriage has become increasingly important, and our industries will require both rail and water carriers for the adequate performance of the ever-enlarging work of transportation.

# INDEX

(1)

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